THE

VETERINARY JOURNAL

SEPTEMBER 1902.

Editorials.

ON THE PROFANATION OF KNOWLEDGE.

WE print below the "Particulars of the post of Lecturer in Veterinary Hygiene," which post is offered to a candidate to be selected from the ranks of the veterinary profession by the directors of the Harper-Adams Agricultural College, Newport, Salop. We shall be very curious to see who is appointed, and still more curious to see how the appointed one fills the post, and what results he brings about. We invite the whole veterinary body to watch this case narrowly, because it seems to us that, unless carefully safeguarded and jealously watched, the scheme is merely one for the production of quacks and the profanation of sacred things.

It will be observed that the person to be appointed has to give lectures in college on veterinary hygiene, anatomy, and physiology, but as hygiene has to include "diseases, &c." we may take it that the lecturer will have to be prepared to lecture on pathology, and as he is expected to "give demonstrations," he will have to include a thorough knowledge of clinical medicine and surgery, therapeutics, and pharmacy amongst his accomplishments. He will in fact require to be an Admirable Crichton or a walking encyclopædia, or both. Now, whilst it is true that all the students of all the Veterinary Colleges have gone through a course of the above subjects in order to fit them for the changeful life of a veterinary practitioner, not many are so brilliant even in any one subject as to be fitted to lecture on it and expound its mysteries to the inquiring youth of the country. As for discovering a man who is brilliant enough to lecture on all these subjects—that is a quest which we should not like to undertake. But we go a little further, and we say that if a man is not an adept and an expert in his subject he is not fitted to lecture on it to students, and if not fitted he is not justified in applying for such a lectureship. If our contentions are right—and we challenge the world to disprove them—then the Newport College is not only committing an absurd action, but comes perilously near doing what is scarcely honest. It advertises for a man to lecture on half a dozen profound and difficult subjects and offers him £200 a year, whilst universities

XUM

invite half a dozen experts to take up the same half dozen subjects, and offer each of these experts five or six times the amount of salary. Newport College may attract applicants, but the probability is that either they will be dull fellows who will attempt to struggle through the impossible task, not knowing the impossibility, or else they will be sharp-witted fellows not burdened with too many scruples, who know the impossibility and are determined simply to cajole the authorities, and, when once safely settled, will tacitly show up the futility of the scheme. We should not like to be the Principal of Newport College. If he can attract a paragon of knowledge and virtue, the salary is shamefully inadequate ; if he attracts a dull mediocrity or a clever charlatan, he is not acting quite honestly or ingenuously by the students.

We have, however, a much more serious complaint against the Newport College. Every veterinary man knows the disputes that have taken place within recent years as to the preliminary education of veterinary students, and the variety of the opinions that have been expressed on the subject. Some men have thought the examinations too severe, others too easy, but, after all, the limits of the contest were narrow, and it was agreed by all those who were entitled to express an opinion that preliminary school education of a pretty thorough kind was to be considered a necessary and essential qualification for all our young aspirants. Otherwise, it was conceded, the task of even reading books on anatomy and physiology was rendered impossible or at least fruitless, and the frame of mind and level of thought necessary for the assimilation of these subjects became unattainable. Experience of teachers has amply borne out the truth of these assertions. Will the Newport students have to pass a preliminary examination that will satisfy the Royal College of Veterinary Surgeons, and will the lecturer therefore know that they possess at least a minimum of literary culture?

The next consideration which we wish to lay before our readers is the gradation of studies which teachers have found it necessary to plan. It must be evident even to the most ignorant layman that a knowledge of anatomy and physiology must precede the study of disease, and this latter that of curative measures and operations. Accordingly, a four years' course of study has been arranged, and only in the last year of his studies is the student allowed to treat diseased or wounded animals. This is of course as it should be, but what guarantee of order and fitness have we or Newport College? Will the students be classified, and will no one be allowed to take the lectures on pathology till he has shown sufficient knowledge of anatomy and physiology? If so, the lecturer will require forty-eight hours in his day ; if not, the confusion will be appalling and the results unthinkable.

It may, however, be so arranged that the students of the College shall be compelled to show preliminary efficiency and shall

be properly graded. But what about the rustics to whom the new veterinary teacher is to give lectures? Can they be controlled in any way? We fancy not, and therefore the lectures will be entirely thrown away, or they will do infinite harm by fostering intellectual vanity and filling the rustic mind with entirely false notions. In the one case there will be a profanation of sacred things, in the other there will be a direct and prolific breeding of quacks and empirics and all kinds of false prophets. We really fear this is a case in which the interference of the R.C.V.S., if not of the Board of Agriculture, would be justified, and might profitably be invoked. It is a good thing to stop false measures at the beginning.

There is still another grievance in the present case which we must point out. Will not this lecturer by giving away, or rather by pretending to give away, the secrets of the profession, tend to crush out the regular practitioner, first in the county of Salop and then in the neighbouring counties, till the whole island becomes professionally a desert? For the tendency will be to increase the number of these lectureships in order to carry out the behests of the horrible gospel of cheapness, and, as veterinary surgeons become impoverished, the temptation to accept such posts will become greater and greater, until no choice is left. The whole future of the profession seems thus to be menaced, and with it all scientific treatment of disease in animals. The consequences will of course be disastrous, but they may not show themselves fully till the harm is irreparable. It is therefore the duty of all intelligent and conscientious men, as well as of all men who have even elementary notions of business, to examine this portent and decide as to the action which ought to be taken in order to avert the threatened misfortune. If, as seems not unlikely, the skilled veterinarian is in the not far distant future to be replaced by the bumpkin with a smattering of scientific knowledge, who diagnoses disease in a perfectly fallacious way, and yet because he stumbles on a cure now and again believes himself to be a great physician, then the agricultural wealth of the country is seriously menaced, and the country cannot afford that. If—to contemplate a less acute stage of the malady—the veterinary surgeon is to be called in only when cases become desperate, when therefore there is enormous difficulty in treating them, little satisfaction, and poor pay, the lot of the surgeon will be no enviable one. He will find himself a member of a small, helpless, and rapidly diminishing body of educated men who have to undo the work of the ignorant and prejudiced. He will have no powerful central authority to which he can appeal in case of need, and, as it will become impossible to keep up properly equipped Colleges for a straggling, tiny, and disheartened flock of students, there will be no possibility of his son's succeeding him. Probably he will prefer that his son should sweep a crossing. We have often preached upon the necessity of indivi-

dual and corporate effort and uttered warnings to those stupid people who think that things must right themselves, that when things come to the worst they are sure to mend, and all the rest of the claptrap that one hears so often. Time itself is no force. The feeble man trusts to time, the brave man trusts to his own efforts. Here, we think, is a field for the display of effort.

"PARTICULARS OF THE POST OF LECTURER IN VETERINARY HYGIENE.

"The duties of the Lecturer, which commence on September 25th, 1902, will be:—

"1. To give Lectures in College on Veterinary Hygiene (including Diseases, &c.), Anatomy and Physiology of Farm Animals, and to give demonstrations on this subject to Students on the Farm.

"2. To give Lectures on Veterinary Subjects in the counties on behalf of the College (travelling expenses paid), and to give such advice as may be required from time to time. As lectures and demonstrations on Farriery will form part of the work, preference will be given to experience in this branch.

"3. To give professional superintendence and assistance to the stock on the College Farm.

"4. To assist in carrying out experiments on the College Farm, and in the counties.

"5. To give any assistance in the Department as directed by the Principal.

"The Lecturer will be required to reside near the College, and to give his whole time to the work of the College. He will, however, be allowed to take a *consultive* (*sic*) practice, on the understanding that work entailed in such practice does not in any way interfere with the work of the College.

"The Salary will be £200 per annum.

"The College Session extends over thirty-six weeks, and in addition there are Short Courses and External Lectures to be given. One month's holiday will be given during the year at times to be arranged.

"Applications, stating qualifications, age, experience, present and recent employment, should be made, accompanied by three testimonials, on or before August 30th, 1902, to the Principal."

OUR CONGRATULATIONS TO HIS MAJESTY.

IT becomes us as loyal citizens and faithful subjects of the King to begin our September number with hearty and respectful congratulations to His Majesty and to our Queen. We rejoiced when King Edward ascended the throne, and we rejoice even more to-day because he has now received the official and ecclesiastical sanction of the nation and is crowned monarch of all the Britains. It is almost startling to think that King Edward is the greatest potentate that the world has ever seen. He rules over more than 330 millions of subjects, whilst the Czar, who comes second in importance, owns

the allegiance of only 152 millions. King Edward's territories, even before the close of the war in South Africa, extended to over 11,000,000 square miles, whilst the Czar's territories do not extend much beyond 8,000,000 square miles. These figures give but a faint conception of the gigantic proportions of the British Empire, for figures are generally difficult to understand and are often deceptive, but anyone can perceive that the cares which beset the ruler of such an immense territory and such a vast population, even though they were only ceremonial cares, must be many and serious. And we know that our King does not take his responsibilities lightly but strives to render to every man the respect that is due to his office. In doing this he always shews the most exquisite tact, never giving any legitimate cause for offence, never hurting anybody's feelings, but often conferring immense gratification on a meritorious but retiring subject by a kindly word of recognition. We are told that His Majesty honours our profession by his courteous yet dignified treatment of his private veterinary attendant; he listens with respect to this gentleman's opinions and follows his advice, knowing it to be always sound and trustworthy; he never overlooks the fact that in talking to his veterinary adviser he is talking to his senior and to a conscientious expert; finally, he understands the subject on which he talks. For the King has an amazing knowledge of horses, he knows all the good points of a racer, a carriage horse, and a hunter, and takes an almost professional delight in all things equine. As we all know, he is a generous and discriminating patron of the turf, and attends all the principal race meetings.

In addition to this the King is, in his private capacity, a great breeder of cattle, and he is officially connected as patron or president with all the principal Agricultural Societies of the country. In these days when farming is so little profitable on account of the low price of grain, it is most important that the farmer should keep his eye fixed upon stock breeding for the meat and milk supply of the great towns. We think a great deal more might be done than is done by the British farmer to improve his financial position. Without slavishly copying the ways of his foreign rivals, he might learn a great many useful lessons from these rivals in the way of preparing his goods so as to please the eye of his customers, even if he has to sacrifice some of his cherished beliefs and prejudices. Thousands of pounds that now go to Denmark and France might trickle into the pockets of the British farmer, and thence, we need not blush to say it, in modified volume into the pockets of the British veterinary surgeon. We hail the advent of a royal patron; we pray that his reign may be glorious and peaceful, and we shout with the best of them—

"GOD SAVE THE KING."

Original Papers.

INTESTINAL OBSTRUCTION.[1]

BY CHAS. F. HULFORD, M.R.C.V.S., HASLEMERE.

UNDER the term intestinal obstruction are included all those cases in which the contents of the intestinal canal are obstructed in their onward passage, by causes or conditions occurring within the abdomen or pelvis.

The comparative frequency with which intestinal obstruction occurs is difficult to estimate. It is always fraught with danger, and in a large number of cases is more or less speedily fatal.

The causes or pathological conditions which may give rise to intestinal obstruction vary in nature, in mode of action, and in acuteness and severity of effect. Some are *congenital*, depending upon developmental abnormalities; others are *acquired*, resulting from accident, disease, or physiological incapacity. Some act by compression of the bowel from without, some by constriction of the bowel from within, and others by blocking its canal.

Some come into play suddenly, or almost suddenly, and without warning, and at once lead to complete occlusion. The symptoms are most acute, and in the absence of relief fatal results speedily follow. Some, coming into play with almost equal suddenness and accompanied by almost equally severe symptoms, do not so immediately lead to occlusion; some degree of permeability remains for a time, and the chances of relief are better. Other causes, again, seem to develop slowly. The symptoms, in the earlier stages at any rate, are not acute, the malady takes a chronic course, better opportunities for consideration and treatment are afforded, and fatal results, though they may ultimately accrue, can be longer averted. The causes of intestinal obstruction may be enumerated as follows, in order as nearly as possible corresponding to the acuteness and urgency of the symptoms, and the imminence of danger to life to which they give rise:—

1. Congenital malformation.
2. Internal strangulation.
   - (*a*) By false ligaments or bands, the result of previous inflammatory mischief, either under such bands, or by loops or knots, or in slits, or by kinking caused by traction.
   - (*b*) By omentum or mesentery (in association with some abnormal peculiarity), by bands or in slits.
   - (*c*) By twisting or knotting (volvulus) and consequent compression of the bowel by itself, or by its mesentery.
3. By intussusception or invagination.
4. By constriction, which may occur by cicatricial contractions of the bowel itself resulting from injury or ulcerative disease, or by new growths in the bowel itself.
5. Compression which may be by displaced viscera or by new growths.
6. Impaction of foreign bodies or intestinal concretions; and

Lastly, by impaction of fæcal masses.

Every part of the intestinal tract is liable to be primarily affected by one or other cause of obstruction, but some parts are much more frequently —if not almost exclusively—affected by particular causes. Acute internal

[1] Paper read before the Southern Counties Veterinary Medical Association at Southampton, July 31, 1902.

strangulation by bands almost always affects the small intestines; by twists the sigmoid flexure. Compression and traction especially affect the small intestines. Intussusception most frequently involves the cæcum and colon. Constrictions due to morbid growths are most common in the large intestine.

The symptoms and physical signs of intestinal obstruction are, as a rule, sufficiently constant and characteristic to establish a general diagnosis, but though they vary in acuteness and in certain other respects with the cause and seat of the obstruction, it is, in our patients, almost impossible to determine the differential diagnosis.

In a very large proportion of cases of obstruction depending upon most causes, pain is the earliest, or one of the earliest, symptoms, and in a greater or less degree, though it may change in character, and from time to time remit in severity, it usually persists more or less continuously and constantly very nearly to the end.

The impaction of a foreign body, the commencement of an intussusception, or a strangulation of a portion of the bowel occurring suddenly, is usually signalised by an access of acute pain. Strictures of the bowel and obstructions due to pressure of tumours cause comparatively little pain. Obstruction of the large intestine by impaction of fæces is attended by scarcely any actual pain.

The pain is caused, no doubt, by the injury immediately inflicted on the serous or mucous coat of the bowel, but is very speedily increased or maintained by the effects of the congestion and distention of the compressed blood vessels on their accompanying nerves.

Later comes the pain associated with distention of the bowel itself, and this is increased by the futile peristaltic efforts of the intestine to move on the solid, liquid, or gaseous matters accumulated above the obstruction. At a still later stage, when inflammation is established, the pain and tenderness of enteritis or peritonitis supervene.

Constipation is of necessity a constant symptom of intestinal obstruction. It may be absolute from the first, or may become so after a certain period, and we must bear in mind that even after complete occlusion has occurred there may remain in the bowel below the seat of obstruction some portion of its contents, and the secretions and excretions of the mucous membrane being added, the evacuation of these by natural effort or by enemata may give rise to the false idea that the occlusion is not complete, or that relief has been obtained. Often, however, the bowel below its obstruction at once ceases to act, and after death may be found to contain fæces, although the constipation has been absolute.

In intussusceptions, especially in chronic cases, the bowel is rarely altogether impermeable from the first, although later it becomes so from the effects of the inflammatory swelling. In strictures of the bowel, either simple or from morbid growth, or in compression by tumours, constipation comes about slowly, and is often only rendered absolute by a twist.

The occurrence of obstruction, from whatever cause, is followed by distention of the intestine above the seat of obstruction from accumulation of its contents. In acute internal strangulation it comes on rapidly and severely, in chronic obstruction gradually, and in intussusception it rarely occurs, at any rate during the earlier stages.

The more rapidly distention takes place, and the greater its degree, the more serious as a general rule in the case, and the sooner is a fatal result

likely to ensue. It has been noticed that in occlusion of the intestines occurring high up, especially in cases of acute strangulation, the excretion of urine is usually diminished to a great extent, and sometimes almost wholly suppressed; this is no doubt in part due to some reflex inhibitory influence exerted through the sympathetic system upon the excreting functions of the kidneys.

In cases of acute obstruction from the first the pulse is small and thin, and towards the end becomes thready. Usually it is increased, but sometimes it may be diminished in rapidity. The temperature is often lowered to a very marked extent, but rises if peritonitis sets in.

Collapse may occur at the commencement of an acute, or may immediately precede the fatal termination, of a more chronic case of intestinal obstruction. When occurring at the commencement, as in strangulation, intussusception, or sudden impaction of a foreign body, it is no doubt due to the shock of the injury at the moment inflicted. When it occurs after a more or less considerable interval, it is usually associated with rupture of the intestine and extravasation of its contents into the peritoneum.

The general diagnosis of intestinal obstruction rests on the history of the case and on the recognition and due appreciation of signs and symptoms. In order to arrive at a right conclusion not only must we consider all the symptoms, but carefully and thoroughly examine the abdomen by palpation, percussion of the external surface, and by rectal exploration. And we should do all we can to ascertain the differential as well as the general diagnosis at the earliest moment before distention has taken place. In this I regret to say we are severely handicapped by the inability of our patients to help us. Various morbid conditions may give rise to symptoms more or less closely resembling or simulating those of intestinal obstruction, among such may be mentioned certain forms of colic, enteritis, and peritonitis. In these conditions there is arrest of action but not mechanical obstruction of the intestine, a distinction which it is important to bear in mind.

The tendency of intestinal obstruction, from whatever cause, is towards a fatal termination at an earlier or later period according to circumstances, but in respect to the more acute forms there are scarcely any in which relief may not be afforded sometimes occurring spontaneously, and sometimes in consequence of the treatment adopted.

Some of the complications that are liable to occur and to conduce to the fatal result are peritonitis, enteritis, ulceration and perforation of the bowel, and hæmorrhage into the bowel or peritoneum.

TREATMENT.

The treatment of intestinal obstruction must necessarily be determined by the cause and the circumstances and condition of the particular case with which we have to deal, but I may not inappropriately refer to a general line of treatment upon which no doubt we all more or less act, inasmuch as tentative measures for relief are often called for before any definite conclusion as to the precise cause of the trouble can be arrived at.

Purgatives.—As a rule when the existence of obstruction is established, and emphatically in all acute cases, violent purgatives are to be avoided. They tend to increase rather than relieve the mischief. The object should be in the first place to soothe and not to irritate and excite the affected part. In cases in which a violent purgative has been given (and this is

often done before the surgeon is called in) failure of effect decidedly contra-indicates the repetition of any similar dose. When all urgent symptoms have subsided a mild laxative often proves of great service, but it is then necessary to be very cautious.

Sedatives.—In almost all cases sedatives and antispasmodics are demanded, and opium and belladonna, conjointly or separately, are most useful. Personally, I always start with a hypodermic injection of morphia et atropine.

Enemas, more or less copious, of simple soap and water with or without the addition of oil, turpentine, or ether, are constantly of great service in cases of intestinal obstruction in affording relief.

Hot fomentations and poultices, especially with the free application of local anodynes (solutions of opium or belladonna) often materially relieve suffering, and thus as well perhaps as by causing determination to the surface and lessening internal congestion, favour recovery in some cases.

Abdominal Taxis.—Careful manipulation of the abdomen, with movement of the animal, has been productive of good. Unfortunately our patients do not lend themselves to surgical operation, inasmuch as differential diagnosis is so extremely difficult and hazardous.

Finally, we should always bear in mind that any abdominal derangement quickly lowers the vitality of the patient, and the more rapidly we can give relief the better.

PARLIAMENTARY REPRESENTATION FOR THE PROFESSION.[1]

Mr. James Fraser, F.R.C.V.S. (St. Alban's), then introduced the subject of Parliamentary Representation in a well-reasoned address. The solidarity of the human race he said was a modern expression. It was the expression of a modern ideal. He might add further that it was the aspiration of every man who took a wide view of the destiny of the human race. It involved necessarily the idea that each man, and each body of men, have a niche, a place hewn out for them, which they and they alone could usefully occupy. He claimed for the veterinary profession that it had a place, and that it had duties which belonged to it which nobody but the profession could discharge. To-day they were not allowed to occupy that position, and what was worse still, men who were incapable of discharging the duties for which the veterinary surgeon was specially qualified were placed in these positions, involving serious loss to the nation of which they formed a part. The question immediately comes, what is the function of the veterinary profession as part of the nation? What duty was it prepared to discharge in the nation's welfare? He had no hesitation in saying there were two and two only, speaking generally. The first was that they were to protect the citizens of this country from the attacks of disease that might be communicated from the lower animals to man, and in that way to conserve human life. Secondly, they were to protect the material interests of the people, for he need hardly remind them that no small part of the nation's wealth consisted of animals. Horses, cattle, sheep, and swine composed a large proportion of the wealth of this and other countries

[1] Eastern Counties Veterinary Medical Association, Summer Meeting at Norwich.

XUM

of Europe. They and they alone were capable of looking after the interests of the people by preserving and conserving animal life. The fact that they were excluded and prevented from discharging this duty involved this country, quite recently, in very serious loss. Did he claim too much when he said that the late disastrous war, which they were all glad was over, was undoubtedly prolonged from the fact that the veterinary department was undermanned, and those engaged in the service of the Government in the veterinary department did not have due attention given to their expressed opinions as to the treatment of horses in the army? Had proper consideration been given to their views he did not think the war would have lasted half the time it had. They knew that the neglect of horses in the army involved the British forces in South Africa in serious disadvantage as compared with the Boers. They had again and again by correspondence and deputation endeavoured through their Associations and Council to remove the disability from which we had suffered. Generally speaking, they had failed. Little and sometimes no attention had been given to their protests, and things had gone on in the usual incompetent way. This was not only applicable to the War Office, as they would see from the correspondence laid on the table, but the Board of Agriculture. Was it becoming, he would ask them as British citizens, for the Minister of Agriculture to refer to the veterinary profession as he had done over and over again. Was it complimentary to them that he esteemed himself to possess a knowledge of the nature of the diseases from which animals suffered that they themselves did not possess. He did not wish to speak disrespectfully of Mr. Hanbury, but was it not the fact that every time he had spoken he not only sneered at veterinary surgeons but also revealed how particularly unacquainted he was with the diseases of animals with which he had to deal? In the counties, though members of their profession were employed, did they receive the treatment and the pay to which they were entitled. From experience and observation he believed that if they were entrusted with larger powers it would be a great advantage to this country. They would naturally, and very reasonably, ask him how he proposed to modify these conditions, and place the veterinary profession in the position it ought to occupy and for which it was fully qualified. In his judgment the only effectual way was by sending a veterinary surgeon to Parliament. He did not suggest returning a veterinary surgeon to Parliament to represent the profession, but that a veterinary surgeon should be in Parliament as a man practically acquainted with the laws that govern the diseases of animals and the best methods of combatting those diseases. He would go further, and claim for their profession that the House of Common was not complete as a representation of the people until a veterinary surgeon was there.—(Applause.) They might say that this was a somewhat high ideal, and that it would be difficult to support the position he had taken up. He would refer to two or three points in the history of our Empire which would fully establish and justify his position. He need not trouble them with any prolonged history of Parliamentary representation, but there were just two or three points to which he might refer. From the time of the great Charter, when the people first began to take a share in the government of the country, down to this day, the fact was manifested in the Statute Book of this country that legislation closely follows representation.

Take the struggle that preceded the Reform Bill of 1832. Those who

were interested—and he presumed they all were—in the history of their country knew what a tremendous political struggle that was. What was its immediate fruit? Three remarkable and significent things followed. We had food for the body and food for the mind relieved of the burden of taxation, by the abolition of the corn laws and the abolition of the duty on paper. We had a third thing more significant still—the abolition of slavery from the whole of the British dominions. That was the direct result of the expressed wish of the people through their representatives. In 1867 we had another Reform Bill when the foundation upon which the franchise was built was extended so that the people had a more potent voice in the Legislature. After the Reform Bill of 1867 two or three things immediately followed, and this he claimed in support of the position he was taking. First we had the great Education Bill of 1870 by which the people expressed through their representatives in Parliament their desire to have the children of this country educated; we had the abolition of purchase in the Army. We also had the abolition of religious tests at the Universities, and we had voting by ballot. In 1885 we had another Reform Bill, though the actual words by which it was described were a Redistribution of Seats Bill. The fruit of that was that we had a whole crop of social legislation which no doubt was a great advantage to the people of this country. He thought he had made it clear that the representatives of the people, when the facts are made known, have legislated to remove any grievances or any injustice from which any section of the community suffered. He contended that a veterinary surgeon on the floor of the House of Commons, disclosing to Parliament, and through Parliament to the country, the injustice from which the profession was suffering (although this was not his main point), and through this injustice the loss inflicted upon the community. Further, various sections of the community soon began to see the advantage of being specially represented. We find that landowners, lawyers, medical men, merchants, artisans, and even labourers see that if their interests are to be protected and promoted, they must have a representative in Parliament. They took immediate measures to secure this, and every one of them obtained it. It was appropriate that he should advocate this subject in Norfolk, which was the first county to acknowledge the claims of the agricultural labourer to Parliamentary representation. The veterinary profession of to-day perhaps stands unique. It is probably the only body that has no voice and could not express their wishes in Parliament. He was told when he introduced the subject the other day at the Council that there are so many difficulties in the way it would be simply foolish for them to attempt such a task. He did not believe there is a single insuperable difficulty in the way. He would mention one or two that had been advanced at 10 Red Lion Square only the previous week. The first is this—and at first sight it seemed a formidable one—that there are not a sufficient number of veterinary surgeons in any single constituency who would be able to return a member to Parliament. A moment's thought and a little familiarity with the history of representation would bring illustrations into their minds entirely parallel with their own case. The school teachers of this country are represented by a very able man sent for the express purpose of representing schoolmasters, and very useful service he is just now rendering. Is there a constituency in Great Britain which contains a sufficient number of school teachers who possess votes to return one to Parliament? Yet West Notting-

ham has returned Mr. Yoxall, and very good reason they have to be proud of him. What the schoolmasters have done veterinary surgeons could do. Of that he felt sure. Then he was asked how were they to get a candidate. It involves the possession of great wealth, and they did not possess many wealthy men in their profession. Undoubtedly that is so, but there was no difficulty in that. Some of the most useful members in Parliament were not men of wealth, nor are they men who have nursed constituencies or flattered them by gifts. By the way he had got a candidate, for since he addressed the Council in the past week he had applied to one member of the profession, and in reply to his very first letter Colonel Nunn, of the Army Veterinary department, replied that he was willing to become their candidate, generously, but quite unnecessary making the proviso—until they got a better man. They did not want a better man.—(Applause.) He was able, he quite understood their case, he was a fluent speaker, a cultured man, and in every way would answer their purpose admirably. That was one difficulty gone.—(Hear, hear.) He was told if they got a candidate where would they get a constituency. There was not the slightest difficulty about that. They numbered some three thousand odd members, and he could not believe that if they all put their shoulders to the wheel with one object they would not be able to secure it either by personal or political influence, and obtain a constituency that would listen to what their candidate would have to say. Then it has been said, suppose you send a member to the House of Commons, what difference will one vote make there? It only means one on a division, and a Government, whether Liberal or Tory, would snap their fingers at him. He had a splendid illustration to meet that argument. They all remembered Samuel Plimsoll. He was not a monied man. He had only one vote, but he had a true heart and one aim. He knew what he wanted, he stuck to it, and got it.—(Applause.) Perhaps they would not be so fortunate as to get a man like Samuel Plimsoll, but one man who would stick to his guns not giving in, but keep hammering away at the Government, would accomplish his purpose, and the veterinary profession would be in a far more useful position than they occupied to-day. He particularly wished that as a profession they should have no selfish end in view. It is not that they would benefit themselves, though that would be a great advantage. The very struggle to secure a Member of Parliament would be of infinite advantage to them. It would pull them all together, and instead of debating as they sometimes did, wasting time and talent over practically small matters, they would unite in a splendid effort and accomplish something worthy of themselves. That would be some advantage, but it was not the advantage he asked the profession to aim at. Their object should be an unselfish one—that they might benefit the community of which they formed a part. They should take a larger view of the situation, and not be satisfied until they were allowed to discharge the duties to the State that they felt proud to be able to fulfil. He would be glad, if they considered his suggestions reasonable and possible, to have their support by sending such a resolution as they might think wise to the Council of the Royal College, stating their desire that the profession should represent its views in Parliament, and that they would make some little sacrifice to ensure that object.—(Applause.)

PROTARGOL IN VETERINARY SURGERY.

EXTRACTS FROM A PAPER BY W. E. WYMAN, M.D.V., V.S., PORTLAND, MICH.

Quittors.—As long as the necrotic tissue does not lie below the level of the coronary band, protargol injections will give quick and satisfactory results. Beyond that drainage is essential, and the quickest work is done by the knife.

Injuries to the Coronary Region, especially when infection has taken place, often lead to serious consequences. The diffuse phlegmonous states and gangrenous processes spreading to the sensitive laminæ and leading to ungulation, cause death. A penetrating and strongly bactericidal agent is here desirable, and protargol is the remedy *par excellence.* After removal of the hair and all lacerated tissues the wound is thoroughly disinfected by a creolin, or, better yet, formalin bath; next, the wound is covered with absorbent cotton, which is kept moist with the protargol preparation. This dressing is permitted to remain for three or four days, unless the pain and swelling increase. In those cases with phlegmonous states of the subcutaneous connective tissue protargol or any other agent is likely to fail, as septicæmia or more likely pyæmia may bring on a fatal termination. The many observations made on injuries to the coronary region the past winter plainly show that protargol, without a question, is the safest, most penetrating bactericidal agent at present at the disposition of the surgeon in the treatment of injuries of that delicate part—the coronary region of the hoof.

In diseases of the eye protargol gave excellent results in all forms of purulent conjunctivitis, employed in 1 to 5 per cent. solutions, the treatment consisting in washing out the conjunctival sacs with a soft rubber bulb syringe once to three times daily. The œdematous state of the eyelids, as a rule, disappeared in two to six days, the purulent discharge rarely persisting longer than nine days. Ulcerations of the cornea as met with in distemper of the dog are readily handled by swabbing the part with a 10 per cent. protargol solution once daily for five days. Protargol in powder form has been used in a great many accidental wounds and in those made by the surgeon's knife. It readily adheres to the parts, forming a dry scurf, under which the process of healing, free from pus, takes place. The writer has used it instead of iodoform in numerous neurectomy wounds, healing by first intention being the rule, with better scar formation than any other antiseptic dressing, dry or moist, formalin being the only one which forms a close second.

Twice the writer has had the chance to prescribe protargol internally. The fact that it is not precipitated by dilute salt solutions, albumin, dilute hydrochloric acid, &c., puts its spere of usefulness at once above nitrate of silver, and, outside of a slight constipating effect, nothing deleterious was observed.

Summary.—1. The application of protargol, even to delicate parts, as the eye, seems to annoy the animal but momentarily. When applied to fresh wounds no inconvenience seems to be experienced by them at all.

2. It is a powerful and penetrating bactericidal agent.

3. It is a most active cicatrisant.

4. It is of special value in purulent infiltration of soft tissues.

5. In eczematous dermatitis of the lower phalanges, it is the best remedial agent known to the writer, but has no special influence upon the course of dermatitis chronica verrucosa (greasy heels).

6. It gives superior results in the treatment of fistulous tracts, provided the general rules of surgery as to drainage, &c. are observed.

7. In otitis externa (canker of the ear) its action is astonishingly prompt and lasting.

8. Its peculiar properties render it continuously active, as it is not detrimentally influenced by the constituents of wound secretions.

9. Internally in gastro-intestinal ulcerations its action seems to be prompt and safe.

(From *Jour. of Comp. Med. and Vet. Archives.*)

POPULAR VETERINARY LECTURES.

To the Editor of the VETERINARY JOURNAL.

SIR,—At last the popular veterinary lecturer has reached our district, and we were surprised to observe in the advertising columns of the local papers an announcement in glaring capitals that a "professor," hailing from the Dublin College, was to lecture at different centres.

There was also a paragraphic announcement describing the lucid and plain language used by the lecturer. The last of these lectures was delivered at the Court-House, before an audience of well-known farmers and rich agriculturists. This drew a lengthy description from the local press, and we are told by the latter that the meeting resembled a professor and his class; the latter after the lecture catechising the professor on many points.

The treatment of milk-fever, &c. was described, also the inoculation for black-quarter. As a "sop" for the local practitioners the lecturer kindly suggested that a veterinary surgeon be called in to show them how these details were to be carried out. We presume that after this it would be a question of "go thou and do likewise."

During the week following this lecture many of our agricultural clients made inquiries from us concerning these new methods, but were surprised when we told them that they were of longer standing than even the "professor" himself.

We have no doubt but that the dispensing chemists will do a good trade as the result of these lectures. Now if this philanthropic "professor" devoted his energies to districts out of reach of professional aid, we might excuse his zeal; but to come to a city and endeavour to interfere with our means of living by giving gratis advice to wealthy individuals by means of lectures is carrying the joke too far.

We believe this "professor" is a teacher; if so it seems a strange proceeding on the one hand to teach students how to earn their living, and on the other hand to teach the public how to avoid calling for their services. What would be thought of a medical man connected with a university or teaching school who advertised in a similar manner to the above, and endeavoured to teach the public the elements of medicine in a popular fashion?

This district is amply supplied with qualified veterinary surgeons, so that no excuse can be offered for the conduct we complain of. At the present time, as the result of veterinary lectures and veterinary editors to

lay papers, the income of the practitioner is seriously curtailed. The chemist is the gainer thereby, as in a large number of places where formerly we were able to earn fees for advice and attendance our services are now dispensed with, and a medicine cheat is substituted. Iodide of potassium is almost a household commodity, while chloral hydrate, and even the Schmidt treatment of milk-fever, are freely employed without any professional attendance.

Where does "social status" come in under these circumstances, and how are we to live and pay expenses? We would suggest to this "professor" to lecture to his own clients in his own district, and he will soon learn the baneful effects of gratis advice given in the form of lectures.

I send newspaper containing advertisements and a graphic description of the lecture.

"CORK COUNTY COMMITTEE OF AGRICULTURE.

"Our advertising columns to-day contain particulars of a series of lectures on abortion and other diseases affecting farm stock which will be delivered by Professor Mason, of the Royal Veterinary College, Dublin, during the week commencing Aug. 4 next. Professor Mason's lectures are totally devoid of technicalities, being delivered in simple, lucid, and effective language, and from the favour with which they were received in West Cork we have no doubt the farmers in the districts to be visited will derive much benefit from attendance at forthcoming fixtures."

E. WALLIS HOARE, F.R.C.V.S.

COUNTY COMMITTEE OF AGRICULTURE.

LECTURES ON ABORTION, ETC.

PROFESSOR MASON,

ROYAL VETERINARY COLLEGE, DUBLIN,

Will deliver Lectures on ABORTION, etc. during the coming week as follows:—

MONDAY, Aug. 4—Lissarda.
TUESDAY, Aug. 5—Bandon.
WEDNESDAY, Aug. 6—Mitchelstown.
THURSDAY, Aug. 7—Millstreet.
FRIDAY, Aug. 8—Kanturk.
SATURDAY, Aug. 9—Council Chamber, Courthouse, Cork.

Particulars as to hour and place of lecture in local posters.
All interested invited to attend.

J. T. CARROLL, Secretary.

RELATIVE SUSCEPTIBILITY TO FOLLICULAR MANGE.

BY CECIL FRENCH, D.V.S., WASHINGTON, D.C.

SOME recent observations on follicular mange have led me to believe that the young of the domestic dog possessses a greater predisposition to infestation by the parasite *Acarus folliculorum* than does the adults. A Great

Dane bitch, aged eighteen months, in perfect health, without any sign of skin trouble, and which with its mate had been in isolation from other dogs for over a year, gave birth to a large litter. Ten weeks later one of the pups was shipped to a distance of some five hundred miles, and another was obtained by myself and introduced to my own kennel, being placed in the company of another Dane bitch, aged four years, with a puppy of its own, aged eight weeks.

At that time every animal was apparently in perfect health. Three weeks later I observed the hair of the head of the newcomer to be falling out. Closer examination showed the head and front of the neck to be diffusely inflamed with a few minute, isolated pustules. Microscopical examination of the contents of the pustules revealed the presence of the *Acarus folliculorum*.

Understanding the almost ineradicable nature of this disease when diffuse, I immediately removed this animal and destroyed it. At the same time I inspected the remainder of the litter and found every one of the puppies similarly affected. The mother of the litter, though still running with her offspring, showed no trace of the disease.

I next closely examined the puppy of the second bitch, but found the skin clean and free of any disturbance. This animal and its mother were removed to new quarters, in order that they might be far from any possible source of infestation in the old. Four weeks later this puppy also developed the disease, and about the same time I received word that the puppy which had been sent away at the beginning was also infested.

Neither adult bitch has shown any trace of the disease up to the present, a period of two months since the second puppy was destroyed.

These cases would seem to demonstrate that puppies are highly susceptible to infestation by the follicular parasite; that the disease is very contagious among them; that adults may enjoy freedom from infestation amounting almost to immunity, and that the parasite itself may exist in the soil in localities where it is indigenous.

THE INTERCOMMUNICABILITY OF HUMAN AND BOVINE TUBERCULOSIS.[1]

BY MAZŸCK P. RAVENEL, M.D., BACTERIOLOGIST OF THE STATE LIVE-STOCK SANITARY BOARD OF PENNSYLVANIA.

From the Laboratory of the State Live-stock Sanitary Board of Pennsylvania.

(*Continued from page* 104.)

In general the determination of the primary lesion is based on the belief that the lymphatic glands in children give evidence of the duration and extent of tubercular disease in the organs with which they are in relation. Consequently if the bronchial glands show more advanced caseation than the mesenteric the infection is put down as being through the respiratory tract. The fallacy of this has, I think, been demonstrated as regards infection through the tonsils, and that it is correct, even when the absorption takes place through the intestinal mucosa, is open to question.

[1] An address delivered at the Annual Conversational Meeting of the Pathological Society of Philadelphia, on Thursday evening, April 24, 1902.

During intestinal digestion there is a constant current from the intestine to the mesenteric glands, and thence up the thoracic duct into the venous circulation. Any tubercle bacilli which may have gained entrance into this stream are carried almost immediately into the lung, and deposited there by election.

It has been shown by Dobroklonski,[40] working under Cornil, that the tubercle bacillus can penetrate the wall of the intestine in the absence of any demonstrable lesion, and that the contact does not need to be prolonged. As the result of carefully conducted experiments on animals he says:—"Tuberculosis can certainly invade the body through the digestive tract. For this invasion to occur, it is not necessary that there should be either a lesion of the intestinal wall, a desquamation of the epithelium, or any local modification whatever, or an anterior inflammatory process. The tuberculous virus (bacilli as well as spores) can easily pass through the epithelial lining of the intestine when it is entirely normal. This penetration is particularly easy at those points where the contact of the virus with the intestinal wall is prolonged, but it is not necessary that there should be prolonged contact or that it should be any longer than what occurs normally."

In our work at the laboratory of the State Live-stock Sanitary Board we have often been struck by the extensive involvement of the lungs in animals infected by feeding, and the slight injury of the intestines. Indeed, in some animals, it has been impossible to detect any involvement of the intestine at all.

I ask your attention to specimens from two animals illustrating these points. The first is from a cow (No. 26435) which was fed with bovine tubercular material. Both lungs were involved and had cavities in them. The bronchial glands were enlarged, and showed small nodules. The mediastinal glands were enlarged and softened, but showed no nodules. The mesenteric glands were normal, and no lesion of the intestinal wall could be found.

The second is from a monkey fed with a pure culture obtained from the mesenteric gland of a child (culture BB). Both lungs are involved throughout and to a much greater extent than the abdominal organs. The bronchial glands are enlarged and caseous. In the intestine only one point of injury can be found, and most of the mesenteric glands are normal in size, and show a few nodules 1 mm. in diameter. Three glands associated with the upper intestine are much enlarged and show caseation, though not more advanced than what is seen in the bronchial glands.

The specimens from the monkey illustrate another important point, namely, the occurrence of coincident infection through the upper part of the digestive tract and the intestine. If this animal had been examined without the knowledge of its history it would almost certainly have been put down as one of those cases in which the avenue of infection could not be positively determined. The lungs show much more extensive disease than any of the abdominal organs, and the bronchial glands show caseation, as well as some of the mesenteric, and to an equal degree. This monkey was tested with tuberculin before the experiment began, and was in perfect health when the feeding with tubercle bacilli commenced. The key to the situation lies in the enlargement and caseation of the cervical lymphatic glands, indicating an infection through the tonsils or some neighbouring part of the upper digestive tract, though no lesion could be detected. We have here an undoubted food tuberculosis, yet the respiratory tract shows

the chief involvement. Does not the same thing occur also in children, and more often than we suspect?

With these facts in view it seems not impossible that an infection gaining entrance through the intestine may appear first in the lung, and thus be erroneously attributed to the respiratory tract.

On one point all pathologists as well as clinicians seem to agree, that in children tuberculosis shows a marked tendency to become generalised, and this occurs with such rapidity that it is often impossible to decide where the infection gained entrance.

The post-mortem statistics are gathered mainly from hospitals and asylums for children, and it is in children that we have most reason to fear infection by food, their diet consisting as it does so largely of cow's milk. The tremendous mortality of children from tuberculosis has forced us to pay particular attention to the study of the factors at work in early life, and a number of interesting and valuable analyses of autopsy records have been published. From England we get the most positive evidence of infection through the intestine, and the most striking proofs of its frequency. English pathologists are practically unanimous in regarding the intestine as a frequent path of infection, the primary lesion being associated with this tract in about 25 per cent. of all cases. We may examine the figures given by some of the more recent writers on this point.

Carr[50] examined 120 cases at the Victoria Hospital for Children, London. Of these in eighty-two the disease was generalised, in the sense that the lesions in different localities seemed to have a "common simultaneous origin from some infective centre, or else that there were several quite independent tuberculous centres in different parts of the body." In seventy-nine cases the primary lesion was in the lung or bronchial glands; in twenty cases in the intestine or mesenteric glands; in six cases it was impossible to tell whether the respiratory or the digestive tract was first involved; in eleven cases widely separated caseous foci were found, and the primary lesion could not be located; in four cases no centres could be found, the lesions being generalised.

Guthrie,[51] at the Children's Hospital, Paddington, London, examined seventy-seven cases. He considered that in forty-two cases, or 54·5 per cent., the primary lesion was in the respiratory tract; in nineteen cases, or 24·6 per cent., it was in the intestinal tract. Of the remaining sixteen cases, the thoracic and abdominal organs were equally affected in seven; in six the origin was unknown, and in three otherwise accounted for. In only thirty-two cases could the origin of the tuberculosis be traced with certainty to the glands, to the thoracic seventeen times, and the mesenteric fifteen times.

Still,[52] at the Great Ormond Street Hospital for Children, in 769 consecutive autopsies on children under twelve years of age, found 269 cases which showed tuberculous lesions. Of these 117, or 43·5 per cent., were children under two years of age; and 56·5 per cent.—more than half the total number—were children under three years of age. The origin of the disease was as follows:—

Lung,	105	138 = 51·3 per cent.
Probably lung,	33	
Intestine,	53	63 = 23·4 per cent.
Probably intestine,	10	

Ear, ...	9	15 = 5·5 per cent.
Probably ear, . .	6	
Bones and joints, . .	5	53 = 19·8 per cent.
Fauces, . . .	2	
Uncertain, . . .	46	

In forty-three cases in which death was due to other causes, such as diphtheria, heart disease, &c., the primary focus of infection could be determined with great certainty, as the tuberculosis had not become generalised. Among these the primary lesion was respiratory in twenty-six cases, or 60·4 per cent.; intestinal in sixteen, or 37·8 per cent.; and in the ear three times.

Dr. Shennan,[53] of the Royal Hospital for Sick Children in Edinburgh, found among 278 cases of tuberculosis 28·1 per cent. in which infection had taken place by the intestinal tract, showing that the high percentage in which this route of infection is observed is not confined to London, where it might be supposed that conditions were such as to favour it specially.

The few reports we have from America indicate that infection through the intestine is much less frequent than in England.

Northrup[54] reports that among 125 autopsies in only three was the primary lesion found in the intestinal tract. In thirty-four cases, however, the disease was so general and far advanced that he was unable to determine the mode of invasion.

Holt[55] among 119 tubercular children examined post-mortem found the intestines affected forty times and mesenteric glands thirty-eight times, but in no case did he consider the intestine as the route of invasion.

Bovaird,[56] in 1899, published the records of seventy-five autopsies on tubercular children. In sixty cases infection had taken place through the respiratory tract; in eight the bronchial and mesenteric glands were equally involved, and in seven the records were incomplete. He has recently[57] added the record of fifty cases, among which two cases of primary intestinal infection occurred. The number of indeterminate cases is not given.

German statistics, as far as I have been able to obtain them, do not sustain Koch's position, although they indicate that primary intestinal tuberculosis is not so common in that country as in England, which we would hardly expect, considering the precautions prescribed in Germany and the lack of regulations in England.

However, intestinal involvement in children appears to be quite frequent in most parts of Germany; and as many of the reports do not clearly indicate the primary seat of invasion, we are justified in believing that a fair proportion of these cases are due to intestinal infection. For example, the statement given by Koch and attributed to Baginsky—that among 933 cases of tuberculosis in children he never found tuberculosis of the intestine without simultaneous disease of the lungs and bronchial glands—is entirely indefinite as to the primary seat of the disease, and as quoted furnishes no ground whatever for Koch to stand on.

Against the figures given by Koch—which are confined to his own experience—the reports of Baginsky, and a series of cases attributed to Biedert, we have the statement of Professor Hueppe[22] that "the number of these cases (primary intestinal tuberculosis) occurring in children is by no means so small as Koch alleged. The number of cases may be fairly reckoned as between 25 and 35 per cent. of all deaths of children from tuberculosis."

Among fourteen children who died from other diseases, and in whom the existence of tuberculosis was not recognised before death, Kossel [58] found tuberculosis of the bronchial glands ten times and of the mesenteric glands four times. In twenty-two children who died of tuberculosis he found the disease confined to the intestinal tract in only one case.

It is unnecessary to quote further statistics on this point. The extent of intestinal tuberculosis varies in different countries and in different parts of the same country—a fact which of itself indicates a local factor, such as the greater or less prevalence of tuberculosis in cattle. One cannot study such statistics as those given without being fully convinced that a very important proportion of the children who die of tuberculosis are infected through their food, and that the report made to the Council of the British Medical Association was justified, namely, that "the mortality from tuberculosis in early childhood is not decreasing as it is at other ages in the United Kingdom; and the opinion that this great prevalence of the disease in childhood is due to infection through the alimentary canal by milk from tuberculous cows appears to be well founded." [59]

Extent of Tuberculosis in Cattle.—It is well known and so universally acknowledged that tuberculosis is a wide-spread scourge in cattle, that it would be superfluous to give an array of figures showing the extent of its ravages in various countries. Those interested in this phase of the subject will find the latest statistics given by Dr. Leonard Pearson in Bulletin No. 75, issued by the Commonwealth of Pennsylvania, Department of Agriculture. In studying such statistics it must be borne in mind that it is the milch cow, and especially the cow on the dairy farms near large cities, that is most apt to fall a victim to tuberculosis. In Pennsylvania, Dr. Pearson [60] has found that of the tubercular herds tested about 13 per cent. of the animals had tuberculosis. Some herds show a very high proportion of diseased animals. Thus, for example:—

Among	174	cattle	.	.	.	.	166	were	tubercular.
,,	73	,,	.	.	.	.	59	,,	,,
,,	22	,,	.	.	.	.	17	,,	
,,	14	,,	.	.	.	.	14	,,	,,
,,	20	,,	.	.	.	.	20	,,	,,
,,	59	,,	.	.	.	.	53	,,	,,

In other parts of the State tuberculosis is very rare or even unknown. These places are found in the interior counties, where the stock is "native" for the most part, or were stocked at a time when bovine tuberculosis was very little known in the United States.

There has been and is considerable discussion as to the stage of the disease at which a tubercular cow becomes dangerous through the passage of tubercle bacilli into her milk. Some authorities hold that there must be actual disease of the udder for this to occur, while others believe that this is not necessary. As early as 1893 Dr. Theobald Smith showed that the tubercle bacillus may be found in the milk of tubercular cows when the udder, so far as the naked eye could tell, was free from disease. In a series of experiments at the laboratory of the State Live-stock Sanitary Board of Pennsylvania the mixed milk of five cows was examined by intraperitoneal inoculation of guinea-pigs. These cows had reacted to tuberculin, but were in good condition and of fine appearance. Repeated examinations of the udders by several veterinarians failed to reveal any

lesion, and examination after death of the animals gave the same negative results. No attempt was made to concentrate the bacilli; on the contrary, the whole quantity of milk was well shaken, in order to imitate as nearly as possible natural conditions, and moderate doses of milk (10 c.c.) were used. Of eighty-eight guinea-pigs employed in the test sixty-three lived long enough for the development of tuberculosis, and of these ten, or 15.8 per cent., became tubercular.

More surprising and more unusual are the results of Rabinowitsch and Kempner,[61] who inoculated the milk of fifteen cows into guinea-pigs, the experiment being made to determine whether or not the milk of cows having a tuberculosis which could be detected only by tuberculin, and not by physical examination, might be virulent. Three examinations were made by a veterinarian in the course of the experiment. Of the fifteen animals ten were found to give virulent milk, a percentage of 66·6. One cow gave milk which contained a yellowish, gelatinous material, and caused a fatal peritonitis in all animals inoculated. Leaving this out, the positive results amount to 71·4 per cent. All of the cows had reacted to tuberculin, but none showed clinical evidence of udder disease when the experiment began. Of the ten giving virulent milk three showed advanced general tuberculosis, but no disease of the udder; two showed no evidence of disease at all, and one only on the second and third examinations. One cow had râles at the time of first examination, but these disappeared, and she showed no evidence of disease after. On post-mortem one cow was found to have tuberculosis of the udder, and one showed clinical evidence of it on the third examination, made six months after the experiment was begun. The authors conclude: "Milk may contain tubercle bacilli, first, in beginning tuberculosis, without discoverable disease of the udder, and, second, in latent tuberculosis that can be detected only by the tuberculin reaction;" also "milk from cows that react to tuberculin must be suspected of being infectious in every case."

With these results before us we must admit that while tuberculosis of the udder is the most dangerous condition, we cannot by any means regard the milk of cows with general tuberculosis, but the udders of which are free from the disease, as being safe for food. We must insist that danger is not limited to those herds which harbour one or more cows with udder tuberculosis. I cannot agree with those writers who attempt to belittle the dangers to which milk-fed babies are exposed by pointing out the comparative infrequency of tuberculosis of the udder. Dilution with the milk of other cows free from tuberculosis no doubt lessens the danger, but does not remove it.

Acid-fast Bacilli.—A few years ago Moller announced the discovery of a bacillus having the morphology and staining reactions of the tubercle bacillus. He has shown that this bacillus and others closely allied to it may constantly be found in forage and in the fæces of animals fed on such forage. Petri, Rabinowitsch, Grassberger, Korn, and others have found the same or like bacilli in milk, butter, and margarine; Rabinowitsch has isolated one of the same group from a case of gangrene of the lung in man; Karlinsky has shown their presence in nasal mucus, and Marpman has found them in urine, so that we know that this group of "acid-fast" bacilli has a wide distribution in nature. The property of resisting decolorisation by mineral acids was for a long time considered diagnostic of the tubercle bacillus. The discovery, therefore, of a comparatively large group of

organisms having the same property, and being indistinguishable morphologically under the microscope, has served to throw some doubt on researches on which the microscope has been relied on entirely to demonstrate the presence of the tubercle bacillus in milk. Animals such as guinea-pigs and rabbits inoculated intraperitoneally with cultures of these bacilli, or with milk, butter, &c. containing them, develop nodules which may sometimes be mistaken for tuberculosis. However, such mistakes must be rare, and there can be no doubt that the true tubercle bacillus passes into the milk of tubercular cows as shown above. Reinoculation, microscopical examination of the tissues, and, the isolation of cultures can be relied upon to clear up the diagnosis of any doubtful cases.

SOLUTION OF THE PROBLEM.—In the solution of the problem before us the most directly valuable data will, I think, be obtained from the examination of cultures isolated from the abdominal organs of children in whom there is reasonable evidence of infection by the intestinal tract. When these cultures are found to have a high degree of pathogenic power, and are able to infect cattle in moderate doses, we will be justified in saying that the children from whom they were obtained were infected in the first instance from bovine sources. By the examination of a large number of such cases we will, I believe, obtain very valuable information as to the frequency with which children are infected by milk. On the other hand I do not consider that we can entirely exclude bovine infection even in those cases where the abdominal organs yield a culture of feeble virulence, for the reasons that we at present know nothing of the effect produced on the bovine bacillus by prolonged residence in the human body. It is certain that the various types of tubercle bacillus known to us have sprung from a stock common to them all, and that they have acquired their racial peculiarities by residence in different animals, through which they are subjected to a difference in food, temperature, and resistance. In other words, the struggle for life is carried on in the various species of animals under varying conditions, the result being that in each animal the tubercle bacillus acquires properties which best enable it to carry on life in that particular host. The acquisition of these peculiarities no doubt requires a certain lapse of time, but how much we do not know. We have experimental evidence that it does not require a great time to change the tubercle bacillus from a higher into a lower type. By the method of inoculation in the peritoneal cavity in collodion sacs, Nocard [62] has shown that in from five to eight months both the bovine and human bacillus can be made to acquire the cultural characteristics of the avian bacillus, and to a certain extent its pathogenic action also. A few passages from fowl to fowl during four to six months increased this greatly. By passage through the blind-worm Moller [63] has in the course of a year so changed the human tubercle bacillus that it grows like the organism of fish tuberculosis, and has the same temperature reactions. It grows best at 20° C., and ceases to grow entirely at 30° C. The bacillus of fish tuberculosis, discovered by Dubard,[29] had for its origin the human bacillus, the fish having fed on the sputum and dejecta from a patient far advanced in phthisis. The fish had been subjected to this for about a year before the disease was noticed.

With these facts before us I do not think we are forcing a point in believing that it is at least possible for the bovine bacillus to become rapidly so changed in the body of man that it will show the cultural and pathogenic peculiarities which we find usually in cultures of human

origin. For these reasons our observations should be made by preference on cases which are rapid and acute.

CONCLUSION.—The evidence at hand forces us to conclude that human and bovine tuberculosis are but slightly different manifestations of one and the same disease, and that they are intercommunicable. Bovine tuberculosis is, therefore, a menace to human health. We are not in a position at present to define positively the extent of this danger, but that it really exists cannot be denied. In the past there has probably been a tendency to exaggeration, but however great this may have been it does not now justify any attempt at belittling the risk, and it is folly to bind ourselves to it.

The eradication of bovine tuberculosis is amply justifiable from a purely economical standpoint; viewed in its bearing on human health it becomes a public duty.

REFERENCES.

49. Dobroklonski. Archives de Méd. exp. et d'anatomie path., March 1, 1890, p. 253.
50. Carr. Lancet, May 12, 1894, p. 1177.
51. Guthrie. Lancet, February 4, 1899, p. 286.
52. Still. British Medical Journal, August 19, 1899.
53. Shennan. Quoted by M'Fadyean, *loc. cit.*
54. Northrup. New York Medical Journal, February 21, 1891.
55. Holt. Medical News, 1896, vol. lxix. p. 657.
56. Bovaird. New York Medical Journal, July 1, 1899.
57. Ibid. Archives of Pediatrics, December 1901.
58. Kossell. Zeitschrift f. Hygiene, 1896, Band xxi. p. 59.
59. Quoted by Still. Loc. cit.
60. Pearson. Commonwealth of Pennsylvania, Department of Agriculture, Bulletin No. 75, 1901, p. 21.
61. Rabinowitsch und Kempner. Zeitschrift f. Hygiene, 1899, Band xxi. p. 137.
62. Nocard. Annales de l'Institut Pasteur, September 1898, vol. xii., No. 9.
63. Moller. Lancet, July 27, 1901, p, 204.

CONTAGIOUS GROWTHS IN DOGS.[1]

IN the *British Medical Journal* for July 19th, Dr. Charles Powell White, Yorkshire College, reports two most interesting cases of contagious growths in dogs, which have recently come under his observation. We feel sure that many such cases have occurred in the patients of our readers, and we would urge upon them to place them on record, and also to have a careful microscopic examination made of them. An investigation of this nature will undoubtedly tend greatly to assist the investigators in cancer.

It is more than twenty years since we saw our first case, and the history was as follows:—A stud champion collie, S——— by ———, was brought to the College suffering from hæmorrhage from his prepuce. On examination of the penis we discovered two soft, red, gelatinous, and broadly pedunculated tumours—each about the size of a large bean—growing from the mucous membrane external to the penis; these were removed and the case terminated without any untoward symptom, and without recurrence or metastasis within a few months. We were asked to examine a collie bitch having a large growth in her vagina, and which was feared might interfere with impending parturition. The growth was diffuse, soft, red, and bled easily. It was removed, and she progressed without ill results.

On inquiry we discovered that she had been lined by S——— by———

a few weeks after we had operated on him. Microscopically the tumours were identical, and were described as small round-celled sarcoma—in fact they were so much alike that we frequently gave a few of the sections out to our class on pathology, as being a distinct transmission of a tumour from animal to animal. We occasionally come across them, but have never again had the same opportunity of tracing and knowing of the owner of the parent tumour. Dr. Powell White's cases are thus recorded by him.

The animals affected were valuable pure-bred bulldogs. The history was as follows:—A bitch A was served by a dog C, which, on careful examination, appeared to be perfectly healthy. Shortly after pupping a growth appeared in the vagina,[2] and five months later a tumour was noticed in one of the mammary glands. The growth in the vagina and that in the mamma were removed simultaneously twelve months after the appearance of the vaginal growth. The bitch at the time of the operation was much wasted, but since that time has become healthy, and now, after an interval of three years and a half, remains perfectly well. A second bitch B was served by the same dog C about four months after the bitch A. A growth appeared in the vagina shortly after pupping, and was removed thirteen months later. This bitch also remains perfectly well at the present time, three years and a half after the removal of the growth. Both bitches have bred since the operation, each giving birth to two valuable litters.

The dog C served four other bitches, all of which were infected and died from the effects of the growths. One only pupped, and her pups were very weakly. The bitch B was served by three other dogs. All of these developed growths and died from the effects. The dog C also died.

I examined the growths in the bitches A and B. In both cases the growth took the form of a warty condition of the vaginal mucous membrane, involving the whole circumference for a distance of 1 inch to 1½ inches; it was confined to the mucous membrane and did not infiltrate the muscular coat. During life the growths bled on the slightest touch and were very tender. The growth in the mamma of the bitch A was encapsulated, and measured about 2½ inches long by 2 wide. Microscopically, the vaginal growths were found to consist of small round cells, closely packed together, supported by a delicate lymphoid-like reticulum. The epithelium, though thin, was continuous over the surface of the growth. There was very little tendency to infiltrate the surrounding structures, the boundary of the growth being very sharp, but there was no capsule. In the specimen from the bitch A there could be seen in the wall of the vagina in the neighbourhood of the growth a lymphatic vessel, with what was apparently a minute nodule of growth in its wall. The mammary tumour in the bitch A was of the same histological structure, except that there was a considerable development of fibrous tissue, causing it to resemble a fibro-sarcoma.

The operation in both cases consisted in the removal of the affected portion of the vagina, the healthy portion being subsequently sutured to the skin at the vulval orifice. Steps were taken to prevent subsequent contraction of the orifice.

What is the nature of these growths? Washbourn and Bellingham Smith in their second paper did not hesitate to call them sarcomata, and certainly their histological structure is identical with that of lympho-sarcoma.

They differ, however, from sarcomata as we know them in the human subject in many respects.

In the first place they are in the highest degree contagious, and the contagion may apparently be conveyed, although there are no growths visible at the time. The dog C was carefully examined at the time of serving both bitches, and showed no evident signs of growths. In the next place they show a very slight degree of malignancy. There is little or no infiltration of surrounding parts, and it is very rare to find metastatic deposits; there is also little tendency to ulceration. Again the growth is very slow; both these cases were of over a year's duration. If we consider the mammary tumour in the bitch A to be a metastatic deposit—and, except for the formation of fibrous tissue, the structure was identical with that of the vaginal growth—we have the remarkable fact that the bitch was permanently cured by the removal of both primary and metastatic growths. In all these respects these growths differ from sarcomata as we know them in man. On the other hand, they have some analogies with the infective diseases, such as the high degree of contagiousness and the long incubation period. The contagiousness of these growths has been used as an argument in support of the theory of the parasitic causation of malignant disease, but I do not think that we can safely draw any conclusions from them at present. The fact that the growths are contagious does not necessarily imply that they are due to parasites, since the infective agents may be the tumour cells themselves. The fact that the growths cannot be transferred to any animals except dogs points to the conclusion that the transmission is an example of transplantation rather than of infection. I am informed that the growths are occasionally inherited, and that they may then appear in maiden bitches. The subject is one of great interest, and deserves further study.

I am indebted to Mr. J. R. Anderson, the owner of the dogs, for the opportunity of examining these specimens, and for permission to publish them.

REFERENCE AND NOTE.

[1] Infective Venereal Tumours in Dogs, *Journ. Path. and Bact.*, 1898, vol. v., p. 99; Infective Sarcomata in Dogs, *British Medical Journal*, 1898, vol. ii. p. 1807.

[2] Although I describe the growths as situated in the vagina, yet in both cases they were situated posterior to the urethral orifice, so that the urethra was not seen during the operation.

SOUTH AFRICAN EXPENDITURE.

THE Fourth Report from the Committee of Public Accounts has been published as a Parliamentary Paper. In respect to accounts relating to South African Expenditure the Committee state that very great difficulty was experienced in obtaining satisfactory vouchers for the large number of payments for supplies purchased in South Africa by officers in the field. After some observations as to the alteration needed in the form of the voucher to make it satisfactory, the report continues:—

On the subject of remounts the following passage occurs:—"A sum of £168,000 has been paid for remounts for which only the receipts of the agent through whom the animals were bought, and not the receipts of the vendors, can be produced. Evidence has been given that in one case of the purchase of mules in Spain it was discovered by the purchasing officer

that an agent locally engaged by him was receiving a commission both from the British Government which were purchasing, and from the dealers who were selling mules. This agent was dismissed and the price of mules went down, but his brother, employed by another British officer, was retained, and the price of mules in the latter case exceeded that in the former. Your Committee were informed by the War Office that these officers were sent out 'with general instructions to purchase mules, leaving everything as to any details of the method of purchase or adequate vouchers to their own discretion,' without their attention having been called to existing Army regulations on the subject. Your Committee desire to express their strong disapproval of this course of proceeding, and they are of opinion that in all cases involving purchase for the Government every officer sent out should have instructions distinctly showing him what is expected from him, and laying down certain broad lines pointing out the dangers which should be avoided."

With regard to demurrage charges, the following observations are made:—"The heavy sum of £276,000 is included in these accounts for demurrage charges against the War Office, in consequence of the delays in unloading ships at Port Elizabeth and Cape Town. In one case a forage ship, the 'Hyson,' was detained for four months at Port Elizabeth before unloading. . . . The officers capable of giving the fullest and most satisfactory evidence are in South Africa, and in their absence your committee restrain from expressing any decided opinion upon these unfortunate and expensive delays."

ROYAL INSTITUTE OF PUBLIC HEALTH CONGRESS AT EXETER, AUGUST 1902.

VETERINARY AND FARM HYGIENE.

THE VETERINARY ASPECT OF PUBLIC HEALTH.

THE Veterinary and Farm Hygiene Section met yesterday afternoon at the Royal Albert Memorial College. Mr. W. H. Bloye, F.R.C.V.S., delivered the Presidential address, the subject being "The Veterinary Aspect of Public Health." Although not always recognised to the full, the connection between veterinary pathology and public health, he declared, is a very close and intimate one. Many diseases of animals are freely and directly communicable to man; many, again, are freely communicable by the ingestion of diseased and disease-bearing meat and milk; and, again, after death many are sources of the greatest danger to the persons entrusted with the disposal of the carcases. In the first cause perhaps rabies in the dog and glanders in the horse take the greatest toll of human life. A short time ago we had almost begun to think that, in Great Britain at least, the stamping out of rabies was within sight. Unfortunately, however, outbreaks have occurred, first in Wales, and then in Devonshire, the one being distinctly traceable to the other. The Board of Agriculture made praiseworthy efforts, which will probably ultimately prove successful, at stamping out the disease. Glanders is a disease fortunately confined to a few large towns, but is probably more dangerous to human life than rabies, because it may unsuspectingly, as well as readily, be acquired by an animal atten-

XUM

dant in the ordinary discharge of his work. Then, among the second class, animals that die from anthrax are among the most virulent. Yet, while the public is deeply concerned and alive to its risks, it is comparatively indifferent as to the presence of disease germs in its meat and milk, Of the many diseases communicable to man through his meat supply, perhaps none has created or received greater thought and experimental research than has tuberculosis. It is now known that hereditary tuberculosis is an almost unknown quantity, and, consequently, that the disease is preventible, while it is also admitted that the danger of tuberculosis by ingestion of meat has for a considerable time been exaggerated. Yet probably no one was prepared for the astounding statements made by Dr. Koch at the Congress on Tuberculosis in London last year, that the disease is not intercommunicable between animals and man. The appointment of a Royal Commission has resulted from this pronouncement. Dr. Koch's deductions were reasoned by analogy, in this instance by the degree of communicability of human tuberculosis to animals. The fallacy of this reasoning has been brought out by Professor M'Fadyean and Dr. Revenel (Pennsylvania), who point out the greater pathogenic power of the bovine than of the human virus. Mr. Bloye urged that no effort in the prevention of tuberculosis, through either meat or milk, should be relaxed. (Applause.) Beyond tuberculosis, however, he pointed out, there are numerous other diseased conditions discoverable in animals after death. the meat of which, if eaten, might prove highly dangerous, and even fatal. This brought him to the consideration of one of the most crying evils of the day, viz., the slipshod and haphazard way in which the most important duty of meat inspection is in the majority of instances conducted. Qualifications necessary for the post of Meat Inspector are an intimate knowledge of comparative anatomy and physiology, and of the pathology and post-mortem appearances of the diseases of meat-producing farm stock. The remedy for the present state of affairs lies in the appointment of veterinary surgeons as Meat Inspectors, or preferably as Veterinary Officers of Health, who should act in conjunction with the Medical Officers of Health. (Applause.) Manifold other duties occur, chief among them being the inspection of cow-sheds and dairies and the investigations of outbreaks of contagious disease. A question of real importance is that of the disposal of carcases of dead animals, which in some towns is becoming a distinct menace to public health. In conclusion, private slaughter-houses should be abolished, and in their places properly appointed and controlled public abattoirs should be established.

MILK PRODUCTION IN RURAL DISTRICTS.

Mr. F. T. Harvey, F.R.C.V.S. (St. Columb), dealt with "Some points on the hygiene of the Udder and the conditions of Milk produced in rural districts." Not long since, he asserted, whatever milk was required in a small town or village was produced in the immediate neighbourhood, and fetched, as required, from the dairies by the consumers themselves. Now the milk is delivered direct nearly everywhere. It may be produced miles away and the milk cart is seen in quite small villages. He affirmed that in a great many cowsheds in villages and rural districts there is room for very considerable advance in construction, ventilation, and cleanliness. There is still a proportion of rural dairymen who either do not think about such matters as contamination with any kind of dirt or disease-producing

germs, or else regard the exclusion of dirt as an unnecessary refinement. Any form of contamination is due invariably to carelessness or oversight on the part of the management, and is not directly attributable to the cow, if one excludes, perhaps, the existence of an early and non-recognisable (clinically) tuberculosis in the udder. The owner of cows has much to be thankful for in regard to the Compulsory Notification of Diseases Act (man), as it renders it no longer necessary to invoke the assistance of the cow in explaining the origin of obscure outbreaks of disease affecting man. With regard to the improvement of country cowsheds, he thought this might be effected without much expense in many respects, as in the following particulars :—An impervious floor is necessary, increase in the number of glass windows made to open, the lack of attention in this respect being amazing, and a good supply of water for the cleansing of the hands and teat as well as the shed. Leaving milk uncovered in the cowshed until all the cows have been milked is a very objectionable practice, while muck-ponds near horse and cow sheds are injurious both to man and beast. As regards the transmission of diseases, very few, Mr. Harvey declared, are transmissible directly to man by means of milk. Cows affected with anthrax yield very little or no milk, so the danger of man contracting disease by drinking the milk is very small. He would always object to a cow infected with actinomycosis, especially if any ulceration had occurred, being in a dairy. As for tuberculosis, he thought that it was among the animals which were retained after they ceased to be profitable that one would find the larger number of cases. But the percentage of old cows is never very great in a district dairy. He considered dairymen could not be too assiduous in attending to all breaches of the skin of the under-teat, whenever present, as they played a more important part in the hygiene of milking than has hitherto been accorded them. It is very desirable that all recently purchased cows having eruptions, of whatever kind, on their teats should be isolated until healing has occurred, as it is not sufficient that the cow should be milked after the others.

The difficulty of enforcing cleanliness was referred to in the discussion which followed,—Dr. Vasher, Cheshire County Medical Officer of Health, stating that he had known a lad spit upon his hands just before milking. Councils had no power to enforce cleanliness, and everything else was useless until they had. Mr. J. T. L. Bickford said, at Newton Abbot the Rural Council had adopted regulations for enforcing the cleanliness of dairies and cowsheds. Dr. Slade-King (Ilfracombe) considered it to be of more importance to educate public opinion than to form a number of regulations, as that would have more weight with a dairyman. This was an opinion that was pressed home by Mr. Penhale, who thought that to get dairy people to wash their hands before milking, and to adopt cleanly habits generally, should claim the attention of all who seek to influence public opinion. He emphasised the point, too, that sunlight is as important as light. A member declared his objection to the modern separators, and expressed his belief that the old-fashioned method of scalding the milk was far preferable. Mr. Penhale said it had been hoped to have a paper dealing with this subject by the county analyst, but his experiments were not yet sufficiently complete. It was a question whether the temperature of milk was raised sufficiently high by scalding to be sterilised. The necessity for the appointment of veterinary medical officers of health was enforced by Mr. M'Lauchlan Young (Aberdeen), who gave an instance of

a cow, from which the owner was unable to get any more milk, being sent to the kennels, where, when the udder was examined, it was found to be eaten through with tuberculous disease. Milk had continually been supplied for a long period from that cow.

MOLASSES AS A FOOD FOR ANIMALS.

The above was the subject of a paper read by Veterinary-Lieut.-Colonel J. A. Nunn, F.R.C.V.S., F.R.S.E., C.I.E., D.S.O., Deputy Director-General Army Veterinary Department. For many years past, he said, cattle had been fed on the Continent on the refuse of beetroot sugar, but the use of cane molasses is of a recent date. It had been recommended, after experiments, that it should be dissolved in hot water and sprinkled over the food; and it was further suggested that the molasses should be put into a bag and suspended overnight in a tub of water, which will dissolve it, and it can be used next day. The following conclusions were arrived at after some experiments in Germany:—That (1) there is no danger in giving a horse a daily ration of at least one kilogram of good peat moss and molasses, 20 to 80 per cent.; (2) that this can with advantage replace an equal quantity of oats; (3) that the general health and muscular energies remain perfect, and the coat assumes a brighter gloss; (4) that in animals subject to indigestion and attacks of colic, the severity of the symptoms diminish or altogether disappear under this regime; and (5) that there is a saving of at least 40 to 50 centimes per head per diem.

Mr. Jones said he had used treacle for a very large stud of horses, with the result that colic cases had decreased considerably.

THE DISPOSAL OF CARCASES.

Mr. J. M'Lauchlan Young, F.R.C.V.S., F.R.S.E., F.K.P.S., Lecturer on Veterinary Hygiene, Agricultural Department, Marischal College, Aberdeen, read a paper with the title "The Soil as a medium for the conveyance of some Diseases." There is no more important medium than the soil for the transmission of disease from one animal to another, he said; if animals that had died of disease were left on the field, or were improperly buried, the organisms bred and spread. The depth of burial had a great effect, for if an animal was buried at about six feet and covered with lime, the organisms became very rare, while the composition of the soil also had a great effect upon the numbers of organisms, as they were more prolific where there was an excess of organic matter. If the regulations of the Board of Agriculture were strictly carried out in the burial of animals there would be little danger of the spread of infection. He advised the burning of any animal that died of disease as the only really effective means of destroying the organisms.

Mr. Barrons asked why lime should be used in burying animals and not some other disinfectant. Mr. Young replied that the Board of Agriculture made their regulations at a time when lime was easier to be obtained than it is now, and it was considered then to be a better disinfectant. The whole law was now rather behind the times, and, no doubt, would be altered soon. The Board were encouraging the burning of animals now.

Mr. Penhale observed that any means which would lessen the number of deaths of rearing cattle every year from such a disease as blackwater should be welcomed by all. More care in burial of animals that had died

from disease was necessary, but if a dead animal was to remain in a corner of a field until the dogs of the parish found it and fed upon it, then disease must go on spreading more and more.

Mr. T. Eaton Jones, M.R.C.V.S., Veterinary Superintendent and Chief Veterinary Inspector for Liverpool, read a paper on the "Veterinary Supervision and Housing of Domesticated Animals." In considering the subject, in which he specially referred to horses, cattle, and pigs, he had thought it well to associate its connection with the veterinary profession. Animals, however well looked after and catered for, invariably, at some time or other of their existence, came under the notice of the veterinary surgeon. It was then that the duty devolved upon him not only to see that their bodily ailments were attended to, but also that the conditions under which they were kept were such as conduced to their well-being. It was his business to determine whether the animal was suffering from any disease communicable to mankind or other animals of the same or different species; whether the disease was of such a nature as to warrant the destruction or isolation of the patient; also as to whether the sanitary conditions were satisfactory, and the attendants competent to administer to the requirements of the animals concerned. It must be understood, however, that the veterinary surgeon was only able to advise and endeavour to persuade owners of stock to carry out his suggestion. He was also able to use his influence with the local authorities whose district he might be in to advise the making of regulations, by means of an Act of Parliament or bye-laws, for the improvement of the conditions under which animals were kept, to ensure that there was a sufficient supply of light, ventilation, air space, and water supply, and that the cleansing and drainage were carried out in an efficient manner. Mr. Eaton Jones then referred to various infectious diseases, with suggestions as to the best course to be adopted in their treatment, and also gave some advice as to the erection and position of houses for animals. In conclusion, he said his excuse for the production of his paper was the deplorable condition he had seen in town and country stables and country cowsheds. In the latter it frequently occurred that animals were huddled together as closely as they could be packed, with no ventilation of any kind, windows entirely absent, drainage arrangements bad, and air space deficient. This state of affairs needed a speedy remedy, and should be tackled in a determined manner, nothing being left undone which would conduce to the greater comfort and health of both animals and mankind.

The President, in opening the discussion, mentioned that hygiene was taught in the veterinary colleges, the housing of stock being a particular subject. Mr. Eaton Jones had not exaggerated in the slightest the disgraceful condition of many stables, cow-sheds, and piggeries. This did obtain and would obtain until some compulsory measures were adopted to remedy such a state of things.

In the course of further diseussion Mr. M. Penhale, of Barnstaple, agreed that foreign hay and grain were not infrequently the cause of anthrax, and urged that manure should be kept as far away from the dwellings of animals as possible. Mr. J. P. Heath, of Exeter, did not think they would ever stamp out swine fever unless it was compulsory on dealers and others to keep pigs for a certain period before disposing of them.

Replying to the discussion Mr. Eaton Jones expressed the opinion that

it would be a long time before they had any satisfactory legislation in regard to swine fever.

COW POX.

This was the subject of a paper read by Mr. P. G. Bond, M.R.C.V.S., of Plymouth, who dealt with it from the point of view of its relationship to man and as a remedy against smallpox. He said the recent outbreak of smallpox in London and elsewhere had drawn the public attention to the remedy of vaccination, that was the introduction into the human system of the specific contagium of cowpox, and which, after having run its normal course, leaves the system inoculated proof against an attack of smallpox. The latter disease was formerly described by high medical authorities as a malignant disease, which destroyed cattle almost as extensively as smallpox did the human race. But this view was evidently the result of a pathological error which led observers to confuse the cowpox with cattle plague. The first successful experiment of inoculating the cow with human smallpox was performed at the Berlin Veterinary College in 1801, the efforts previously having been unsatisfactory. It had not been determined whether smallpox poison originated in man, the cow, or the horse, and the origin would most probably remain a mystery. He had never heard of a case of cowpox having been conveyed to the human race through the agency of the milk. There was some difficulty respecting the cause of the disease. It was as contagious as the other, and perhaps usually propagated by contact, but it occasionally appeared when there did not seem to have been a possibility of contact directly or indirectly with any other animal previously affected. It was the opinion of Jenner and many medical men that the cowpox originated from infection by the matter of grease in horses and which had been conveyed to the teat of the cow by means of unwashed hands. But veterinary surgeons did not believe there was the slightest connection between cowpox and grease. An interesting circumstance connected with pustular eruption was that persons on whom it appeared were for a considerable period, and it was once thought during life, protected from the smallpox. This was known among farmers from time immemorial. The majority of medical men, however, had regarded it as a mere popular error, and to no one whom experience had convinced of the active protective power of the cowpox had it occurred to endeavour to ascertain whether it might not be possible to propagate the affected by inoculation. To the mind of Jenner the probability of accomplishing this presented itself, but Jenner was not the first to try inoculation. It was first done by Benjamin Jesty twenty years before. As to the treatment of the affection in cows very little was required, mild saline aperients internally with local dressing of the udder being all that was required. He was of opinion that sufficient evidence had been produced to justify the faith placed in the inoculation of the human being by the virus of the variola vaccina as a remedy affording protection from smallpox.

The President said that with improved sanitary arrangements he believed cowpox still lessened would soon die out altogether except for producing lymph for inoculation purposes.

Mr. M'Lauchlan Young (Aberdeen), Mr. Eaton Jones, and Mr. W. Penhale joined in the discussion which followed.

XIIM

SUPERVISION AND HOUSING OF DOMESTICATED ANIMALS.

Mr. T. Eaton Jones, Chief Veterinary Inspector for the city of Liverpool, read an able paper on the "veterinary supervision and housing of the domesticated animals." It dealt in a practical manner with various diseases to which horses, cattle, and pigs are subject, and the treatment which should be applied. He also described in an exhaustive manner the kind of premises that should be provided for the housing of animals. His excuse for this was, he said, the deplorable condition in many town and country stables and cowsheds. The state of affairs needed a speedy remedy, and should be tackled in a determined manner.

In the discussion which followed, the President and Messrs. W. Penhale (Barnstaple), P. G. Bond (Plymouth), J. P. Heath (Exeter), R. E. H. Penhale (Torrington), and others took part. The President and Mr. W. Penhale mentioned that anthrax was sometimes introduced by means of imported grain, while Mr. Heath was afraid that swine fever would never be stamped out so long as the present frequent handling of pigs was allowed. He maintained that the animals should have to be in the possession of owners at least a month before sale. This would prevent the purchase of pigs by dealers in affected districts and their resale in open market within a few days.

THE WORK OF VETERINARY SURGEONS.

The President of the Institute (Professor W. R. Smith) attended the meeting of the section, and during the morning addressed the members present. He said the work of veterinary surgeons was not prominently connected with Health Congresses, but those responsible for the management of the Royal Institute were extremely anxious to see a closer alliance between veterinary surgeons and those connected with other branches of public health. It would be for the benefit of the community if that alliance could be brought about. The work they did in connection with animals and their diseases had such an important bearing on the health of man that there were indications that the time had come when they should know all they could from them.—(Applause.) Personally, he was deeply impressed with the importance of the work of the members of this section, and desired that it should be brought prominently forward.—(Applause.)

This being all the business of the section the President proposed a vote of thanks to those gentlemen who had read papers. Mr. Penhale seconded, and the vote was carried with acclamation. Mr. Bond also moved a vote to the Hon. Secretaries (Messrs. J. P. Heath and M. Penhale), which was acknowledged by those gentlemen.

Mr. M'Lauchlan Young suggested that to make the work of the section of some effect the President should attend the annual meeting of the Institute, and urge upon the necessity for the abolition of private slaughter-houses, the appointment of veterihary officers of health, and for suitable provision being made for the disposal of carcases. He moved this. It was seconded by Mr. Howard, and supported by Dr. Glover Lyon. It was opposed by Mr. Bray, of Leicester, but it was carried with only one dissentient.

A vote of thanks to the President was carried, and the proceedings terminated.

HEARTWATER IN SHEEP AND GOATS.

In previous reports I have pointed out that the experiments conducted principally by Veterinary-Surgeon Dixon clearly demonstrated that heartwater was not communicated by the ordinary sources of infection, such as immediate contact, if the in-contact animals were kept free from ticks. It has also been shown that it is not due to any particular plant which the stock eat, because goats which were allowed on infected veld with a flock, but muzzled so as to prevent them from feeding, and were only fed on good sound forage at night, contracted the disease as readily as if they had been allowed to graze; nor is it induced by the lack of any essential food constituents such as common salts or phosphates in the general vegetation of the infected area, for goats which were fed exclusively on good forage, and in addition received a daily ration of bone meal and saline constituents for several months consecutively, readily contracted the disease when exposed to veld infected. The experiments also demonstrated that the cause was neither atmospheric nor telluric, for goats which were tied up in the low-lying spots, specially selected in one of the most infective localities, the vegetation being previously destroyed by fire, and all other sources of infection—especially ticks—excluded, the animals remained perfectly free from any appearance of infection, although proved by subsequent experiment to be susceptible.

Drenching animals with large quantities of the fluid contents of the rumen of goats which died, or were killed, during an attack of heartwater failed to communicate the disease, and even large doses of virulent blood administered by the mouth also failed to produce the disease. In fact, where tick infection was excluded Mr. Dixon failed to communicate the disease to healthy sheep and goats, except by inoculation with virulent blood obtained from an affected animal.

It became very clear, therefore, that heartwater belonged to that class of diseases which owe their origin to some living micro-organism, which, when introduced into the blood of a susceptible animal, multiplies and develops in that vital fluid, and gives rise to all the characteristic pathological changes which are observed in that disease. There is a period of incubation—from eight to ten days—followed by fever, and terminating in an effusion of a clear straw-coloured albuminous fluid into the thoracic cavity and pericardium, with other less marked changes. The characteristic of this fluid is that it coagulates into a jelly as soon as it is exposed to the atmosphere.

The result of these experiments led us to suspect that ticks, or some such skin parasites, were the active medium of communicating the infective agent of heartwater by skin inoculation. Mr. Dixon then commenced a series of experiments with the red and blue ticks—*Rhipicephalus evertsi* and *Rhipicephalus decoloratus*—respectively, but with negative results. He tried at the same time to hatch out the larvæ from the eggs of the Bonte-tick—*Amblyoma hebraum*—but failed owing to an unusual peculiarity in the conditions and periods of incubation, subsequently discovered by Mr. Lounsbury, the Government Entomologist, who at this period recommenced the study of the tick side of this question, which he has continued to prosecute in a most enthusiastic manner ever since and with the most satisfactory results, as his annual report for the past year will show. Mr. Dixon then devoted his attention to the discovery of a preventive remedy by means of inoculation. He found that the disease was communicated by inoculation

either subcutaneously, intravenously, or intra-thoracic, the media used being virulent blood, spleen pulp, and also occasionally the thoracic and pericardial fluid when fresh. He found that the disease can be transmitted by these methods from sheep to sheep, from goat to goat, and from sheep to goat, and from goat to sheep.

The following are the lines on which a series of experiments were undertaken, first by Mr. Dixon and continued and enlarged upon by Mr. Spreull, with the object of discovering a method of preventive inoculation.

Inoculation with Bile.—A series of inoculation experiments with bile obtained from an animal which died of the disease were tried in varying doses, but it was soon apparent that bile gave very little immunity, although some farmers extolled it highly. The fact that the disease will sometimes cease to spread in a flock without any obvious cause may account for this temporary popularity which the bile obtained.

The Blood and Serum of Cattle and Horses.—Inoculations with the blood and serum of cattle and horses after these animals had been fortified by the injection of large doses of virulent blood were tried, but although the blood and serum of these naturally immune animals, especially of the horse, possessed a certain amount of antitoxic action, injections of even large doses gave but a very slight immunity against either artificial or natural infection.

Preserved Virulent Blood.—Inoculations with virulent blood which was preserved (*a*) by adding 5 per cent. of glycerine, or (*b*) ¼ per cent. of carbolic acid in a watery solution, were tried, the mixtures being kept for 24 hours before being used, but the results obtained by either of these methods were very irregular and uncertain.

Citrated Virulent Blood.—The citrated virulent blood was mixed in normal saline solution, 1 to 3, and kept for varying short periods and then injected intravenously, but it proved very irregular in its action and effects.

Serum of Virulent Blood.—This was used fresh one to two days after tapping, filtered through paper. One goat received 7 c.c. intravenously without producing any reaction, but when tested with 2 c.c. of virulent blood intravenously, on the fortieth day it took sick, and died fourteen days later. Another goat received 10 c.c. intravenously, no reaction followed, nor did it react to 2 c.c. of virulent blood injected intravenously on the twenty-seventh day, but when retested with 3 c.c. on the fiftieth day, it died fifteen days later. This line of experiments was therefore abandoned.

Antithermal Blood.—Experiments were undertaken with the object of ascertaining the period at which the blood becomes virulent in an animal sickening from heartwater. These showed that the blood becomes virulent in an acute case produced by inoculation, from 24 to 48 hours before the onset of the fever. In one very rapid case the virulence of the blood appeared six clear days after the intravenous injection of virulent blood.

Small Intensive Doses of Virulent Blood.—This series of experiments were undertaken with the object of intensifying the modified reaction obtained by the injection of small doses of virulent blood intravenously. For example, a dose of 1·5 c.c. of fresh citrated virulent blood injected intravenously fails to produce sickness by itself, but the same dose repeated on the ninth day caused death, and even when the second dose was delayed until the twelfth day, it still produced fatal results. When delayed until the sixteenth day no fatal results followed in five animals so treated, yet no good reaction followed. Mr. Spreull adds: "Further experiments may show

that better results may be obtained if the second inoculation were performed about the fourteenth day, but individual susceptibilities vary so greatly that success in this line is not very hopeful.

Serum Experiments.—With respects to these Mr. Spreull reports :—In our early work with heartwater it was found that the fortified serum of a recovered animal was strongly antitoxic, and since then many attempts have been made to so balance a lethal dose of virulent blood with an inhibitive dose of serum that a mild sickness or fever reaction and recovery might be obtained. Bad as results have been up to the present (this was written in September last), it is this method which has produced almost the whole of the salted animals we possess, and it has consequently continued to attract our attention and inspire us with hope. When I relieved Mr. Dixon, I took over four full-grown goats—Nos. 136, 137, 138, and 139—into which he had injected intravenously 3, 4, 5, and 6 c.c. of a two to one mixture of carbolised serum and fresh citrated virulent blood ; not one of these animals reacted, but when on the twenty-seventh day I repeated the inoculation, using exactly the same doses to each, but altering the proportion of the mixture to seven of serum to four of virulent blood, I killed all four without any lengthening of the incubatory period. The serum used in this case was not the same, but was thought to be equally potent. It was used again in the next three experiments, and with slightly better results. Nos. 140, 145, and 146, kids from eight to ten months old, received into the vein 6, 5, and 4 c.c. respectively of a mixture of virulent blood four parts, with carbolised serum seven parts, kept twenty-four hours before using it. No. 140 died from heartwater on the fifteenth, No. 146 on the eighteenth day, both being fevered for three days, whilst No. 145 did not react. On the twenty-fifth day No. 145 received exactly the same dose for the second time, and again showing no reaction, it received the same dose, 5 c.c., of a mixture in which the blood proportion had been raised to nine-fourteenths of the whole. This produced sickness, and death fifteen days after injection, fever lasting five days. On September 11th three goats, Nos. 199, 201, and 202, each received intravenously 2 c.c. fresh virulent blood and 3 c.c. carbolised serum, which were mixed together just previous to injection. This was followed by a subcutaneous dose of the same serum, No. 199 receiving 5 c.c. on the 13th, No. 201 5 c.c. on the 14th, and No. 202 6 c.c. on the 15th day. No. 201 died suddenly on the 16th day, the autopsy being typical, No. 202 also showed sick on the 16th, and died next day. No. 199 gave a most remarkable and prolonged reaction extending from the 17th to the 40th day or later, being generally mild in character, except on the 33rd day, when it suddenly reached 106° F. in the morning and 107·7° F. in the afternoon, falling during the next two days to a mild fever level, the end of which it is difficult to fix with exactitude. This extended fluctuation gives one a remarkable insight into the slow manner in which an attenuated heartwater vaccine must effect its results upon the animal system, and sounds an ominous warning against early testing. Blood was drawn from this No. 199 on the 23rd day, and 3 c.c., 5 c.c., and 10 c.c. injected into goats Nos. 209, 170, and 159 respectively. No. 170 reacted well and is probably salted, but the other two became violently fevered, in both cases up to 108° F., fed sparingly, and in fact narrowly missed death from heartwater. Other goats have been inoculated with No. 199's blood taken at later periods during its reaction, but it is too soon yet to speak of results.

XUM

The Blood of a recovering Animal.—The object of this series of experiments is explained by Mr. Spreull as follows:—My previous experiments in connection with heartwater taught me that the blood of an animal recovered from the disease became mildly antitoxic some weeks afterwards, and could be made strongly so by fortification. It occurred to me, therefore, that there must be a period of transition between the febrile or virulent and the antitoxic stages. In the hope of obtaining a blood falling short of lethal, yet strong enough to set up changes in inoculated animals which would induce immunity, I instituted a series of inoculations at varying intervals with blood taken from recovering animals.

Mr. Dixon had previously performed two inoculation experiments in this series with 5 c.c. of blood at five and nine days respectively, and both these animals died. I therefore began with a later and more attenuated blood, performing half of the inoculations intravenously and half subcutaneously. These inoculations were made at 11, 15, 16, 20, and 25 days after the fever stage had passed. The results were extremely irregular at first, many did not react to the inoculation, while others had varying degrees of fever, but none of them withstood the subsequent test of virulent blood, even when the testing dose was gradually reduced from 5 c.c. to 2 c.c. What led me to expect immunity from these recovering inoculations was the fact that blood taken from these reacting goats ten days or more after their reaction had ceased, very often produced a similar elevation of temperature in a third, fourth, fifth, and sixth series of goats. In no case did these reactions show any sign of illness, yet the fever was often so acute that I dreaded the onset of the fit which so rapidly terminates cases of real heartwater.

I next tried a simultaneous injection. Two goats received each 10 c.c. of blood obtained from a reacting goat of the fifth series on the 16th day, when it was highly fevered, and to this was added 1 c.c. and 1.5 c.c. respectively of virulent blood. Both goats reacted to this inoculation severely, one from the 10th to the 15th day, and the other from the 12th to the 16th day; in both a temperature of 107° F. was registered, yet no visible symptoms of disease appeared.

Referring to this series of experiments in a subsequent report Mr. Spreull says:—"Since my last report, I have kept up a new chain of reactions, little short of the actual disease in their virulence, by always selecting animals in which symptoms were developed, and waiting until the tenth day, or later, after the temperature became normal; by these means the same pitch of virulence seemed to be well maintained. By tapping earlier, that is, before the reaction ceased, lethal blood, indistinguishable from true virulent blood, could be obtained. On the other hand, by delaying until the 20th day or later, after the cessation of the fever, mild reactions, or none at all, were produced."

After detailing a long series of experiments on these lesions, Mr. Spreull continues:—"From the above it will be seen that any dose of 3 c.c. or more of recovering blood is sufficient, and that we can with moderate care hit upon a period of safety at which fairly severe reactions can be produced with certainty and continued in series." At a later date he returned to the experiments with simultaneous inoculation intravenously of small doses of a mixture of virulent blood and of recovering blood. He says:—"Observing that it became more and more difficult to produce a reaction by inoculating fresh goats with blood drawn from a goat twenty days, or

over, after the temperature had returned to normal, I attempted to strengthen this blood by the addition of a small—that is, less than a lethal—dose of virulent blood, and after a number of failures I think I can claim to have fixed a date when this can be done with comparative safety."

After detailing the series of experiments which led up to this result, he makes the following recommendations:—As 2 c.c. occasionally proves lethal, 1 c.c. or 1.5 c.c. is enough to give in this method of inoculation, and I would make the amount of this dose depend upon the age of the recovered blood, or the number of days after cessation of the fever in the goat which is bled to provide the recovered blood."

The intensity of the attack has also to be considered. The dose of the recovered blood may be anything over 3 c.c., as it appears immaterial whether 5 c.c. or 10 c.c. is used.

The inoculating mixture therefore consists of (*a*) less than a lethal dose of virulent blood, and (*b*) blood from an animal just over thirty days recovered. In these experiments Mr. Spreull points out that subcutaneous inoculation is never so regular and satisfactory as intravenous inoculation, even when the same materials are used.

The Test to which the Inoculated Goats are put.—Mr. Spreull concludes his report as follows:—"If you have succeeded in following all these details, you will be prepared to admit that something little short of virulent heartwater has been produced—a scrutiny of the charts should satisfy you on that point—and I am sure that an inspection of the animals would have convinced any one. In many of the *reacters*, the appetite disappeared, the respiration became hurried, decubitus was constant, and nothing but the fit seemed wanting to complete the very short train of symptoms which are witnessed in the heartwater contracted on the veld."

But notwithstanding these strong fever reactions, many fail to resist the intravenous injection of 5 c.c. of virulent blood, or even a 3 c.c. dose. The question arises, is this intravenous test too severe? It is very evident that no animal which has not shown a fever reaction of 106° F., and over, for at least a week, can withstand an intravenous injection of even 3 c.c. of virulent blood. The next question is, how many of those animals which give a strong fever reaction, but fail to stand the test inoculation, would be able to resist veld infection? Experiments show that a 3 c.c. dose of virulent blood injected intravenously would kill 95 per cent. of healthy susceptible animals inoculated with it, but veld infection falls far below that. The point for future consideration and experiment, therefore, is what fever reaction will be sufficient to withstand veld infection, and to this Mr. Spreull is directing his attention at the present time.

D. HUTCHEON,
Colonial Veterinary Surgeon.

(From *The Agricultural Journal, Cape of Good Hope*, August 1902.)

GEILZIEKTE.

THIS is a peculiar disease characterised by its sudden onset and rapid course. There is acute disturbance of the nervous system, congestion of the venous circulation, and a tendency to the formation of gas in the

stomachs, with rapid decomposition immediately after death. There are several opinions with respect to the nature and cause of geilziekte, those most accepted being the following :—

(*a.*) That it is due to the direct action of a chemical poison which is produced in certain succulent plants by the action of the strong heat of the sun ;

(*b.*) That it is due to the development of a poisonous gas or ptomaine in the stomach of sheep under certain peculiar conditions, either of the food eaten, or of the stomach at the time ; and

(*c.*) That it is caused by a living micro-organism which gains an entrance into the system along with the food, and induces all the symptoms and changes which are observed to follow each other so rapidly in geilziekte.

With respect to the first, the direct action of the sun's rays on succulent vegetation. "In chemical combinations the ultimate atom of bodies do not penetrate each other, they are only arranged side by side in a certain order, and the properties of the compound depend entirely on their order. If they are made to change their place or mode of arrangement by an impulse from without, they combine again in a different manner, and another compound is formed with totally different properties" (Liebig). In like manner rich succulent grasses, vegetables and fruits, when they are exposed to the radiant heat of an abnormally hot sun, have their properties so changed that they are no longer wholesome, and in some cases become positively poisonous.

The succulent grass which springs up after a rain is quite wholesome while it is green and fresh, but when it becomes wilted and blanched by the scorching rays of the sun, it becomes poisonous, and sheep eating it may in a few hours die of geilziekte.

The late Mr. Hellier and others are of opinion that the poison which is produced in succulent vegetation under the action of the hot rays of the sun is a substance similar to oxalic acid.

Finlay Dun says :—"Oxalic acid occurs in rhubarb, sorrel, and other plants," and it is very probable that the quantity may be very largely increased under the conditions referred to.

With respect to the opinion that geilziekte is due to the development of a poisonous gas or ptomaine, within the stomach of the sheep under certain peculiar conditions either of the food eaten or of the state of the stomach at the time, there are certainly some facts which appear to support this opinion.

For instance, when acute indigestion occurs in horses or cattle certain poisonous gases appear to be formed in the mass of food contained in the stomach. These when absorbed into the blood produce first drowsiness, followed by delirium, and death either from coma or violent nervous disturbance (mad staggers). The symptoms of this peculiar deranged condition of the nervous system in horses and cattle are very similar to those exhibited by a sheep when suffering from geilziekte, only that the disease runs its course much more rapidly in the sheep. It is just possible, therefore, that some kinds of vegetation when eaten in considerable quantity under certain deranged conditions of the stomach, may have a tendency to undergo chemical changes, during which a poisonous gas is formed in the stomach, causing serious nervous derangement when it enters the blood and circulates through the brain and nervous ganglia. It must

be admitted, however, that certain kinds of food are much more liable to undergo this peculiar chemical change than others, and when we find a large number of animals dying from this disease about the same time, and within a given area, the weight of evidence points more to some change in the vegetation itself rather than to derangement of the digestive organs of the animals affected.

In further illustration of this, I may mention that during the second week of January 1895, a considerable number of cattle died very suddenly within a limited area of Sand Flats, and my assistant, Mr. Borthwick, who saw some of these cases, states that the cattle died from suffocation due to the rapid formation of gas in the rumen or paunch. The majority of cases were found dead in the morning, but the few that were observed and treated recovered. The medicines used with most success were common salt and turpentine. The farmers thought that the locusts, which were very numerous about that time, had left some poison on the vegetation, but Mr. Borthwick was of opinion that it was due to some sudden change produced in the vegetation by the hot weather, as it occurred mostly where there was an abundance of couch grass. In that area fine rains fell from about Christmas to the New Year, followed a week later by very hot weather, after which the disease appeared and carried off a considerable number of cattle; the cases occurred simultaneously over a wide area, and ceased as suddenly as they began. Further, it is a well-recognised fact that when geilziekte is prevalent in a flock of sheep, if they are removed to a different pasture the disease generally ceases at once.

With regard to the opinion that geilziekte is due to the specific action of a micro-organism, I have always considered that the disease called geilziekte in this Colony bears a strong resemblance to the disease known as "braxy" in Scotland, and veterinary authors have long held the opinion that the latter is a specific disease similar in some of its prominent characters to anthrax, although perfectly distinct in its origin from that disease. The resemblance is shown more particularly in the congested condition of the vessels, and the rapid manner in which decomposition takes place after death.

Further, the fact that a compound such as Cooper's dip acts as an effective preventive of geilziekte, strengthens the belief that the originating cause may be some specific micro-organism. Cooper's powder is a chemical mixture containing arsenic, sulphur, and soda compounds as its principal active constituents, and these are known to be effective agents for the destruction of animal and vegetable parasites. Arsenic has also been proved to be an effective preventive of malarial fever in many cases which have been shown to be due to a micro-organism. Moreover, the fact that the disease is more prevalent on certain farms and in certain localities than in others, although there may be no perceptible difference in the vegetation, the climatic conditions, or the action of the sun's rays on the vegetation in the places where it prevails and where it does not, would indicate that the originating cause must be something special and peculiar to the locality. But whether the cause of geilziekte be a chemical poison which is produced in certain plants by the action of the strong heat of the sun, or a chemical poison which is produced in the sheep's stomach by certain changes which take place in the food after it was eaten, or whether the poison is developed by the action of micro-organisms swallowed with the plants.

There is abundant evidence which is accumulating yearly that a mixture

of Cooper's powder and salt is an effective preventive of this disaase. How it acts is difficult to determine, and it is equally difficult to understand how any medicine, however potent, can continue its preventive effect for such a length of time as Cooper's powder is credited with. True, the effects of a medicine may continue for some time after the medicine itself has been entirely eliminated from the system. In this respect arsenic is known to exercise a special action on the mucous membrane which lines the digestive organs, and it may in this manner produce a condition of the stomach which is opposed to the action of the poison which induces geilziekte.

There may, however, be another explanation to account for the length of time that Cooper's powder is said to act as a preventive of geilziekte. This disease does not prevail uninterruptedly in a flock of sheep even when no preventive measures are adopted. It will often cease for a time, and then reappear with equal virulence, depending on the presence of the conditions which are favourable to its production. Now it may be that the action of Cooper's powder continues for the length of time only that the particular outbreak would have lasted but for the action of the preventive, and that usually a considerable interval elapses before another outbreak occurs. Nevertheless, howsoever, it may exercise its preventive effects, the united testimony of large numbers of sheep farmers places it beyond a doubt that Cooper's powder when given to a flock of sheep, does arrest the disease amongst them in a very short time.

Symptoms.—The animal, apparently in full health, suddenly ceases to feed, and wanders away from the flock, has a staring look, and becomes peculiarly excitable, with a quivering of the eyes. The head is lifted high, the breathing becomes laboured, the countenance appears anxious, and the animal looses the control of its limbs. It totters, falls over, is seized with convulsions, and dies within from one to six hours.

Post-mortem Appearances.—If the sheep's throat is cut before it dies, and it is properly bled, there is an entire absence of any sign of disease except a little congestion of the veins, and the blood is darker than natural. But if the sheep is allowed to die, the body soon swells, and decomposition is very rapid.

Curative Remedies.—Geilziekte runs its course so rapidly that there is seldom time for the effective action of any remedy. The medicines which have been used with best success are, a teaspoonful each of mustard and chlorinated lime, given mixed in a little water; or a tablespoonful of common salt dissolved in water, with a teaspoonful of turpentine, administered carefully. A dose of purgative medicine should be given as soon as the urgent symptoms subside. If there is distention of the rumen with gas, it should be allowed to escape by inserting a proper trocar and canula into the rumen on the left side, leaving the latter in until the gas has escaped. The situation is midway between the point of the hip bone and the last rib, and two or three inches below the point of the transverse processes of the loins. There is no danger provided that the trocar is inserted in a downward direction. If it is inserted horizontally, it might injure the kidney. A long, strong, sharp-pointed knife will answer very well, the blade after insertion would require to be turned half round, so as to distend the puncture, or a small reed might be inserted.

Preventive Measures.—These consist—where practicable—in moving the sheep to a change of veld, but care should be exercised not to place

them on luxuriant pasture when they are hungry, as they would be apt to eat too greedily, and become affected with hoven, if not geilziekte. Experience shows that sheep are less liable to geilziekte when they are allowed to remain on the veld night and day, and graze when they like. Respecting medical preventives, the farmers place perfect reliance on Cooper's powder and salt, one of the former to nine of the latter, giving a teaspoonful as a dose to a sheep, and half that to a lamb.

(From *The Agricultural Journal, Cape of Good Hope*, August 1902.)

PERITONEAL FILARIASIS OF THE OX.

BY JOHN J. REPP, V.M.D., PROF. OF PATHOLOGY, IOWA STATE COLLEGE, AMES, IOWA.

On several occasions within the past few years I have come into contact with a species of filaria in the peritoneal cavity of cattle. This I have especially noticed in spaying heifers. Some time ago some of these worms were sent to me from an abattoir at Sioux City, Iowa, by an inspector of the U.S. Bureau of Animal Industry for the purpose of identification. I was able to identify this parasite as the *Filaria cervina* (Dujardin). For the purpose of identification I would advise the use of a combination having about the power of a 1-6 or 1-8 B. and L. objective and 1 inch ocular. The anterior and the posterior extremity of the worm may be clipped off with the scissors, mounted on a slide in water, and a cover glass put on. By proper regulation of the light the differential characters may be made out quite readily. It is the male which presents the specific distinguishing features. The fragment of worm must be rotated so as to bring these parts into view. This can easily be done by sliding the cover-slip gently in a direction at right angles to the object.

Neuman states that these worms do not play a pathologic rôle. My own observations support this view.

(*American Veterinary Journal*, August 1902.)

HABITUAL LUXATION OF THE PATELLA AND ITS CURE BY DIVISION OF THE INTERNAL STRAIGHT LIGAMENT.

BY J. A. ANGLICKER AND WM. SCHUMACHER, MILWAUKEE, WIS.

On June 6th a twelve-year-old Shetland pony was brought to us afflicted with habitual luxation of the patella of both legs. The animal, formerly owned by a circus, is a trick pony, and may have contracted the lesion while performing the trick of sitting down with outstretched hind legs. The luxation would occur every time the animal moved after standing still, or when walking very slow, but not when walking fast or when trotting. The right leg appeared to be affected more than the left, and the luxation could be produced at will, but through two days of observation the luxation of the left patella was seen only once. The present owner, who values the pony very highly on account of its tricks and it being an excellent saddler and driver for children, wanted a sure cure or none at all, and we decided to perform the operation mentioned in "Moeller's Surgery," attributed to Violet, Santo, Cavallari, and Guigas, and which was also described in the

American Veterinary Review of June 1901, page 221, by Gamba, who refers to it as "Bassi's operation."

After casting the animal we decided on an open operation, because we could not find a way to secure the leg properly, also because the animal is very small and the ligament was only located with difficulty; so we untied the leg, allowed it to drop into its natural position, and held it there by two guy-ropes. The field of operation was then cocained, shaved, and thoroughly disinfected, the internal straight ligament laid bare by an incision one inch long and right over the ligament; a grooved director passed over the capsular and beneath and around the internal straight ligament, and the latter divided with a pointed bistoury. The wound was then rendered aseptic and closed with one stitch. The luxation did not recur after the animal got up, and the patient was then turned into a clean grass lot. A marked œdema made its appearance the next day below the field of operation, but passed away and the wound healed by first intention. In the between-time the left patella would frequently become dislocated, and on June 15th we performed the operation on the left side by the same method. This second wound became infected in spite of our precautions, probably because the flies troubled the patient very much on the shaved spot, and he used his tail freely in trying to keep the tormentors away. The wound healed in two weeks with no other care but daily washing with warm water. The animal is without a fault to-day, and its owner is greatly pleased.

In large horses chloroform narcosis would probably be advisable, as the operation seems comparatively easy when the leg is not restrained, and can be extended and flexed to suit the operator; also because the danger of puncturing the synovial capsule by a sudden jerk of the leg of animal is greatly minimised.

We recommend this operation to the profession because its success is very remarkable in the upward luxation of the patella of the horse, and it should prove very remunerative, because there are many horses afflicted with this lesion in the country who are almost valueless on this account. All we ask is that those brother veterinarians that perform the operation hereafter will report in these columns their observations and conclusions.

(*American Veterinary Review*, August 1902.)

POISONING BY FEEDING ON SINAPIS NIGRA.

BY F. J. ROUB, D.V.S., MONROE, WIS.

SOME cows were turned into a small lot, about 4 acres, situated on river bottom, between the barn and river, lot being utilised to raise corn for early feed in autumn. After the corn was cut off, mustard grew up in abundance, and as there had been no stock allowed to run on this lot previous to November 22, owner thought he would turn his cows in and let them pick up what rough feed there was left, cows being in from 3 P.M. till 5 P.M., only two hours, then being housed in the barn for the night, given their evening ration,—all of them feeding normally. Three hours later he noticed four of the cows being sick.

On my arrival there were ten cows dead and the eleventh one dying, and seven more sick and seemingly going in the same channel.

Post-mortem.—There was an abundance of yellow fluid in the abdominal cavity, and very strong fumes of mustard being present. Speaking of this to the owner, he informed me that mustard grew up in abundance in this lot; and that he noticed the cows eating it and seemed to relish the same. Continuing with the autopsy, there being from 3 to 4 gallons of this yellow fluid in the abdominal cavity; bladder full and of same colour; over the walls of the rumen following blood-vessels and lymphatics there was a yellow gelatinons mass, varying from 1 to 3 inches thick; the intestinal tract showed a slight enteric condition. On opening the rumen I found from one peck to half a bushel of mustard stocks and leaves. Satisfying my own mind that the trouble was due to mustard poisoning, I turned my attention to the seven head in barn that were sick.

Symptoms.—Cows standing, dull, haggard expression; extremities cold; some tympany; respirations laboured; could not be made to move except by main force, then they would stagger and fall unless supported, showing that locomotion was greatly interfered with; when fatal, would stand in one position without moving, until they would fall and lie in a semi-comatose condition from one to three hours before death.

Treatment.—I ordered one and one-half lbs. of sulphate of soda given to each one of the sick cows, and to follow up with one lb. every twelve hours until the bowels moved; in addition I gave nux vomica and spirits nitre. The seven head under this treatment made a fine recovery, and regained the normal flow of milk.

(*American Veterinary Review*, August 1902.)

Clinical Papers.

VOLVULUS OF THE CÆCUM, WITH DISPLACEMENT.

BY HENRY TAYLOR, NEW VETERINARY COLLEGE.

THE subject was a chestnut cart gelding five years old.

History.—The animal had only been in the owner's possession for a couple of weeks, so his previous history was unobtainable. He was first noticed to be ailing at eight o'clock on the morning of his death, and he was then showing symptoms of colic. The owner treated him by administering two draughts of somebody's remedy for this complaint. Relief was not afforded, so our services were requisitioned, and we arrived at 1.15 P.M.

State on Examination.—The animal did not then seem in very violent pain, at least he was not throwing himself about, but he was sweating over the sides of the chest, the breast, and the neck. The region of the abdomen had had applied to it some mustard, not in a limited quantity either, but this had been washed off shortly before our arrival. This probably accounted for the excessive tenderness of the abdomen which was evinced on palpation. The eyes were staring; the mucous membranes, curious to say, were pale; the pulse was so weak it could hardly be felt, but it was somewhere about 80 per minute; the respirations were quickened and the nostrils flapping; the breathing was distinctly thoracic. Rectal examination did not reveal much; very few fæces were found in that bowel, and the hand could only be introduced for a short distance owing to the bowel

being contracted and the animal straining against its introduction. No fæces had been passed since eight o'clock that morning.

At 3.30 P.M. he was pulseless and had muscular tremors in various parts of the body. The pain was apparently not very acute but it was constant. He died at five P.M. after having had one or two fainting fits a few minutes before.

Treatment.—The treatment consisted in the administration of anodynes, which, however, had only slight effect. We tried to give him an enema, but did not succeed.

Post-mortem, made next morning at 10.30—The abdomen was distended with gas. On cutting into it in the middle line no cæcum appeared, as is usually the case, but part of the large colon instead. The cæcum was not at first apparent, but at length the apex was found situated in the right iliac region instead of lying in the epigastrium, which is the commonest position. Moreover the base was lying to the inside and above the fourth part of the large colon (that is in the standing position), and had one or two turns or twists in the direction of its long axis. This displacement of the organ had caused an obstruction to the passage of fæces in the fourth part of the large colon by pressing on it. From the situation of the various organs it appeared to me that the apex of the cæcum must have moved upwards between the first and fourth, and the second and third parts of the double colon, then turned backwards and outwards into the right iliac region; at the same time it had been rotated round its long axis.

The mucous membrane lining the whole of the large colon was much inflamed; in colour it was almost black, and it was so swollen that the thickness of the bowel in several diffuse spots was fully an inch. The outer coats of the large colon were more especially inflamed along the attachment of the mesentery.

The cæcum was not so much inflamed as the large colon. The heart, lungs, and kidneys were not examined, neither were the internal linings of the stomach and floating colon, but viewed externally they looked normal.

Remarks.—One of the anatomical peculiarities of the cæcum is that it is not attached to the abdominal parietes except in the neighbourhood of the crook, consequently it admits of a certain amount of displacement somewhat easily, and its situation in the abdomen is not as constant as some of the other abdominal organs; but a deviation such as the above I think worth recording. Of course if the post-mortem had been made immediately after death the condition of affairs might have been slightly different, but probably only slightly.

A CASE OF OLD-STANDING SPAVIN LAMENESS BENEFITED BY CUNEAN TENOTOMY.

BY HENRY TAYLOR, NEW VETERINARY COLLEGE.

THE subject of the above case was a small Shetland pony belonging to Dr. Hunter, Professor of Physiology. He had been lame for over two years from a spavin in the off hock, and for this he had been blistered four or five times, in addition to having the actual cautery applied on three occasions. During the whole two years he was so lame that he had been of very little use, and for the six months previous to being operated on, absolutely no use. It was resolved therefore to try what cunean tenotomy would do.

The cunean tendon crossed right through the centre of the exostosis and lay as it were in the bottom of a channel whose banks were formed by the exostosis. Previous to section considerable difficulty was experienced in raising the tendon out of the channel because of the depth thereof, but at length we succeeded.

After a time the lameness diminished, and became so slight that the animal could be worked, and as a matter of fact has been regularly worked for the past year. The lameness is hardly appreciable, and does not so far grow worse with work.

I think some part of this improvement may perhaps have been due to the periostitis set up by irritating the bony enlargement in our effort to elevate the cunean tendon, the resulting periostitis would of course conduce to anchylosis.

Extracts.

NOTES ON DISEASES OF SHEEP.

Clinical Lecture—Gravel in Fat Lambs.

BY M. J. MOUSSU, ALFORT VETERINARY COLLEGE.

We are seldom favoured with reports on the diseases of sheep, but I to-day bring before your notice a disease which is very fatal, and the symptoms of which are most characteristic, that occurred amongst a flock of 130 three-month-old lambs that had been highly fed for the market since they were weaned.

About eight days ago the shepherd noticed one morning that two were suffering from severe colic, and making constant but ineffectual efforts to urinate. Both were killed and examined by him in conjunction with his master, but they were unable to arrive at any conclusion.

Fresh cases having occurred during the week, the owner called in a veterinary surgeon in the neighbourhood, who has kindly sent me the specimens I place before you.

The symptoms were the same in all cases. The appetite was at once lost, and they were attacked with violent colic and tremors, getting up and lying down, and unable to remain in one place, with constant ineffectual attempts to urinate. There is heaving of the flanks, and the respirations accelerated. A considerable amount of œdema shortly appears about the scrotum and along the course of the urethra, and if not slaughtered the lamb soon dies.

At the orifice of the prepuce a brownish-coloured ulcer, the size of a sixpence was noticed by the owner, who, considering that the suppression of the urine was due to it, examined the whole 130, and found 43 affected; but on the same farm was a flock of about the same number of ewe lambs, on exactly the same food and kept under similar conditions, that were in splendid condition and perfect health.

The case from which the specimen was taken had an ulcer on the prepuce, but although there was difficulty in urinating, there was not actual retention. It will be noticed that the wool at the orifice of the prepuce is dirty and clotted together, and amongst the fibres are a number of small grains of sand. These were the only symptoms visible, but sufficient to

diagnose the complaint. The following description of the post-mortem appearances was sent to me by the veterinary surgeon in charge.

All the viscera with the exception of the bladder were healthy. This was red, the size of the clenched fist, and when pressed in the hand could be burst without the escape of a drop of urine from the urethra. The lining mucus membrane was greatly inflamed, and the urine red.

In the specimens before you the lesions are better marked. In one the urethra is completely obstructed with subacute endo- and peri-urethritis with intra-urethral hæmorrhage, forming long clots that completely block up the canal from the ischial arch to the extremity, together with a quantity of sandy material. As you will see, it is impossible to introduce the smallest sound, and it is easy to understand how retention of the urine would cause violent colic, and how quickly death would supervene.

In the second specimen you will see that though there is intense urethritis there is no hæmorrhage, and that the canal is obliterated by a collection of sediment a short distance from its extremity. In the bladder were about 7 to 8 drams of the same, forming a ball of grey sand, each grain of which was a small calculus with irregular points, very irregular in shape, and the largest the size of a pin's head.

The owner was convinced that the lambs were suffering from a contagious disease, and caused him to doubt our diagnosis.

I mentioned that on the same farm were a flock of ewe lambs, receiving exactly the same food and kept under similar conditions, that remained healthy. The reason of this can be accounted for by the large calibre and short length of the urethra in the female, allowing the passage of the calculus, even when it has attained a certain size.

The reason why such young animals suffered from calculi is more difficult to explain, but it is well known to all exhibitors of sheep, especially fat stock.

A fact worthy of consideration is that it has been found that three-month old lambs, put up and fed on about three pounds of bran, beans, oats, and lucerne, became affected with cystitis and calculi. It is known that such food is rich in phosphates and carbonates, much more than is required in the animal economy, especially so with young subjects, and that the urine becomes loaded with salines, which are precipitated in the bladder. This theory to me appears to hold good, as I have never seen the disease amongst lambs kept short at grass, and where matters are not being forced, whereas in the flock in question they were getting one-third of a litre of oats, one-half bran, one-sixth barley, and one kilog beetroot.

Of course this supposition is not absolutely indisputable, as all the lambs were not of the same age or weight, and some would eat more than the others.

The owner informed me that for the year he had been fattening lambs for the Paris market in the same way, but never with a loss, and this is quite possible, as the composition of the food will vary in different seasons. The summer of 1901 was very dry, and all grain and forage was abnormally rich in minerals, and this fact may perhaps account for the outbreak which has been recorded in other places in the neighbourhood of Paris.

The complaint is early recognised even without making a post mortem examination. The attacks of abdominal pain, efforts to urinate, and œdema of the sheath, should arouse suspicion, and the agglutination of the wool and presence of grit round the orifice of the prepuce confirm it.

Treatment.—The first indication would be to diminish the quantity of food and alter its composition, but unfortunately this cannot be done or the lambs would at once fall off in condition, but experience has shown that if from the commencement of the forcing a due proportion of bicarbonate of soda is given the trouble will be avoided. The dose is from one-half to two grammes per head daily, and it can be conveniently given by dissolving two grammes per litre in the drinking water.

In cases where the urethra is obstructed, it is generally advisable, if the animal is in anything like condition, to slaughter it, if the urine has not been retained long enough to taint the carcase.

In some cases amputation of the spiral prolongation at once gave relief, the obstruction being driven out with some force by the pressure of the urine behind it, and if the bicarbonate of soda in three to four gramme doses is given, the animal may be fattened without further trouble. Should this not succeed an attempt may be made to break down the mass with a fine hard rubber catheter if it is in the lower part of the canal. The lamb should be held on his back, the penis withdrawn, and the catheter introduced as far as possible, when, if the obstruction can be completely broken down, the pressure of the urine will expel it.

Unfortunately, when the obstruction is large, the urethritis great, like in these specimens, and especially if there is hæmorrhage and formation of clots, catheterisation is impossible.

It is possible that massage of the urethra might break down the obstruction, but with fat lambs it would be difficult, and on most farms impracticable, and the same remarks applies to urethrotomy.

(*Recueil de Médecine Vétérinaire*, 14th July 1902.)

JOSHUA A. NUNN,
Vety.-Lieut.-Colonel.

PIROPLASMOSIS IN THE DOG.

(*Continued from page* 110.)

VIRULENT PRODUCTS: MODES OF INOCULATION: INCUBATION: RESISTANCE OF THE VIRUS.

THE parasite exists in the blood, therefore all the vascular tissues may convey the disease. It was chiefly with the blood that M. Nocard made his experiments. Subcutaneous, intramuscular, or intravenous inoculation produces the disease in one form or other provided the inoculated blood contains parasites. Injection into the veins is the most rapid and surest process. The richer the inoculated blood is in parasites and the younger the dog operated upon, the more serious is the effect produced and the more rapid its evolution. In quite young dogs a single drop of "rich" blood is sufficient to produce a fatal attack; in the case of adult dogs it is only necessary to introduce a cubic centimetre in order to make sure of producing the disease. In the slow form of the disease the blood is much less virulent than in the acute form, leaving out of account the quantity of parasites which it contains; even when inoculated in a large dose it produces only a benign form of the disease. In one of M. Nocard's series of experiments the initial virus came from a dog on the way to recovery whose blood still contained parasites: all the dogs of this series had the benign form of the disease and none of them died.

Whatever be the quantity of blood inoculated, its richness in parasites, and the mode of inoculation, a certain period always elapses before the appearance of the first symptoms. If we examine systematically the blood of the general circulation we see scarcely any absorbed globules before the thirty-sixth hour; as a general rule it is only after two days that the parasites appear, even in cases of intravenous injection. If the inoculation has been performed in the muscles or under the skin the incubation is one of five to six days. In acute cases death supervenes as a rule three days after the appearance of the parasites; very young dogs die much quicker—thirty-six to forty hours after it. If, then, inoculation has been made in the veins the animal dies generally on the fourth or fifth day; if under the skin the animal may survive nine, ten, or eleven days. When the disease produced assumes the slow form its duration is very variable, the animal may remain ill for thirty, forty, even sixty days.

Pure drawn blood kept in a cellar away from the light is still virulent after twenty-five days in winter; in summer it has been found inactive after fourteen days. It loses its virulence when heated to 50° and kept for half-an-hour, at 45° for one hour, at 44° for an hour and a quarter; it is still virulent after an hour and a half of heating at 43°.

ATTEMPTS AT CULTIVATION OF THE PARASITE.

All M. Nocard's attempts to cultivate the parasite remained fruitless. Defibrinated blood of the dog, serum highly charged with hæmoglobin; blood rendered incoagulable by the injection of extract of leech into the vessels of a fresh dog gave no result. If we place in the stove at 37° defibrinated blood very rich in parasites we sometimes observe intense phagocytosis of the infected globule, and also see the parasites undergo profound transformations; whatever be their original form they rapidly become globular or rounded, their kernel becomes central, and then by a sort of condensation or contraction of the protoplasm they diminish in volume to the point of appearing reduced to the mere kernel. The same transformations take place in blood kept at the temperature of the room, but they take place much more slowly so that it is possible to follow all the phases. Even after five or six days the parasites have considerably diminished in volume and seem to be reduced to the kernel, surrounded with a thin layer of protoplasm slightly tinted with very pale blue, whilst the kernel itself is strongly coloured with carmine. After a week or two the red blood corpuscles are very much deteriorated, they seem to have lost the greater part of their hæmoglobin; they take on colouring-matter very badly, and their contour is very difficult to distinguish. Often it occurs that a number of them have stuck together to form a homogeneous shell uniformly tinted very pale orange, in the midst of which the parasites—coloured intense red and reduced to their kernels, which have an aureola of a very thin layer of protoplasm scarcely visible—are scattered in great numbers and may produce the illusions of a culture.

M. Nocard also had the blood of affected dogs sucked by leeches—blood which was very rich in parasites. The leeches, kept in the stove at 22° in water renewed daily, permitted him to examine day by day the modifications which occur in blood thus collected, but nothing is observed beyond what has been already described; so early as the fifteenth day or so the parasites, always voluminous, have assumed the globular form, but they seem to have lost all amœboid movement; the red globules are pale

and tend to agglutinate. During the next day or two the parasites diminish gradually in volume; at the end of a week they seem reduced to their kernel, and are disseminated in a sort of formless stroma resulting from the agglutination and fusion of the red globules; their number has not increased. These deteriorations remain the same till the death of the leech, which occurs from the fifteenth to the twentieth day. It thus appears that the hæmatozoa cannot multiply except in a living and appropriate medium.

IMMUNITY FOLLOWS ON CURE.

Every dog recovering from the natural or experimental disease is thenceforth immune; it supports with impunity the injection of virulent blood in doses much greater than those which are fatal to the control animals. The following cases are interesting in this light. Dog No. 1 recovered from the experimental disease: after two and a half months, when the red globules had again reached the number of 5,740,000, M. Nocard injected subcutaneously 20 cubic centimetres of blood, 3 cubic centimetres of which kill the control dog in seven days; examination of the blood performed every day for twenty-five days showed no hæmatozoa; the thermic curve did not go up. Dog No. 8 (small size) reinoculated six months after recovery by subcutaneous injection of 5 cubic centimetres of blood very rich in parasites; temperature rose on the eighth day to 39°, but no hæmatozoa were shown; the same dog afterwards received at various times up to 72 cubic centimetres of virulent blood without showing parasites. Dog No. 12 received two and a half months after recovery 10 cubic centimetres of virulent blood into the vein and 5 under the skin; temperature remained normal; very rare parasites were seen in the blood on the second, third, and fifth days after inoculation; then they disappeared. Dog No. 80 recovered from a very severe attack of the disease; received two months afterwards 15 cubic centimetres of blood very rich in parasites into the jugular and 5 under the skin; no fever, no parasites. In all these cases the control animals (dogs), inoculated at the same time and in the same fashion with much inferior doses of the same virus, succumbed in seven to nine days or in three to five days, according to the mode of inoculation.

It is thus seen that the immunity conferred by a first attack resulting in cure is at once complete and enduring. Dog No. 8 was still refractory to the disease six months after cure. What is the mechanism of immunity? It has been already said that in the blood of patients, especially of those on the road to recovery, active phagocytosis is produced. It is a common thing to observe great mononuclears which have absorbed two, three, four, and as many as six red globules all infected. Of these globules some have lost already all their hæmoglobin, others show colour almost as well as the normal globules, and between these two extremes all the intermediate stages may be seen; the first have their parasites rounded, very small, scarcely coloured, with an ill-defined contour; in the others the parasites, also little and round, are strongly tinted, and their contour is clearly defined. This phagocytosis goes on likewise in the recesses of the organs; it is observed to be very active on sections of the spleen, even in dogs which have succumbed to the acute form of the disease. In every field we may see mononuclears crammed with absorbed globules on the way to digestion; sometimes the "phagocytized" globules are so numerous that the phagocytes give one the illusion of a capillary cut across. It is always

the mononuclears which englobe the infected corpuscles. M. Nocard has never seen a single globule absorbed by a polynuclear, but it is probable that the polynuclears contribute also to the defence by englobing the free parasites in the plasma; this, however has never been verified.

PREVENTIVE TREATMENT OF RABIES IN THE HORSE BY THE INTRAVENOUS INJECTION OF THE VIRUS OF RABIES.

BY M. COUTE, VETERINARY DEPARTMENT AT MONTPELLIER.

THE researches of Galtier, confirmed by the experiences of Nocard and Roux, have shown that the inoculation of the virus of rabies into the veins not only does not give rabies but may confer immunity. And in their treatise, the Microbic Diseases of Animals, Nocard and Roux say that—"Having regard to the longer duration of incubation, and the less gravity of the inoculation by bites, we can hope that the treatment of animals which have been bitten will succeed when it is undertaken three or four days after the bite."

Moucet had experimented with this mode of treatment with success on three cows; with Rabieaux the result was not so fortunate on an ass.

M. Coute has had the opportunity, following the technique indicated by Nocard and Leclaniche, of trying intravenous injections, which he practised on five horses which had been bitten.

One horse, bitten on the 27th of December 1898 by a dog known to be rabid by post-mortem examination and by inoculation into the rabbit and guinea-pig, was submitted to treatment on the 2nd and 3rd of January—six days after the bite; he died rabid six months after.

Another horse, equally bitten on the 27th of December, received the intravenous injections on the 3rd and 4th of January—seven days after the bite; he took rabies on the 21st of March—eighty-four days after the bite.

On the 16th of June 1900 a horse was bitten on the lips and on the nose; treatment was commenced on the 21st of June—five days after the bite; he took rabies on the 7th of January 1901.

On the 13th of March 1901 a horse was bitten on the fore-leg. The first injection was made on the 17th of March, four days after,—the second the following day. The horse was sold at the end of seventy-one days without having presented anything abnormal, and he has not been heard of further.

On the 22nd of May 1901 a horse was bitten on the nostrils and on the upper lip; the treatment was commenced on the 25th of May—seventy-six hours after the bite; he died at the expiry of 145 days. Thus, of the five treated horses, four succumbed in spite of treatment, ignoring what happened to the fifth. For the first four on which the method has been tried, one may object that the injections had been made after the time fixed by the authors; but for the fifth, treated seventy-five hours after the bite, the result was just as unfortunate. In consequence the method, theoretically perfect, appears only utilisable if the intervention is immediate or follows very closely on the contamination, which is impossible in practice.

Nevertheless there is room to remark that the period of incubation of rabies, which is generally in horses from 15 to 60 days, has been, by the

fact of the inoculations, considerably augmented, varying from 84 to 200 days. The injections, writes M. Coute, powerless to throw off the infection, have retarded its appearance and increased the resistance of the animals treated. The progressive augmentation of the quantity of virus to inoculate, the multiplicity of the interventions, would perhaps render this method of rapid immunity, little expensive and at the call of every veterinary surgeon, fruitful. It is for the masters of our schools to give to us the solution of the problem.

(*Bulletin Vétérinaire.*)

TREATMENT OF LAMINITIS BY LIGATURE OF A DIGITAL ARTERY.

Resort may be had to this treatment in acute and subacute cases of founder when other means have failed. A full-bred horse had been (September 1901) for a month under treatment for founder in all its limbs, more particularly the fore-feet. In spite of all efforts the animal had become incapable of walking to its footbath, and the question now to be decided was whether to slaughter it or diminish immediately the acuteness of the ostitis in the third phalangeals and their podo-keraphyllous continuations. I performed ligature of the external digital artery on the two fore-legs, and very shortly after this walking became less painful. The hoofs, which were deformed, gradually came off the whole four feet and were replaced by fresh horny matter which now (March 1902) constitute hoofs, scarcely circled and with concave soles, whose powerful and regular action are the admiration of the owner and the source of astonishment to many veterinary surgeons who have followed the new treatment. Shortly after the same operation was performed on a full-bred horse troubled with serious deformities of the hoofs due to chronic foundering, with lameness of the right fore-foot. Ligature of the artery was performed only on the lame foot; it removed the lameness, but the deformities in the hoof were not mended and the animal was sold. A third attempt was made on a full-bred horse afflicted with an old subacute foundering of the near fore-foot, which had brought about deformation and considerable atrophy of the corresponding hoof. The animal was brought to me as suffering from lameness, the off hoof not being deformed, but hot; this heat and this lameness resisting energetic treatment for three weeks, ligature of the artery was proposed and performed, and a month later the horse resumed his work, which he executed quite easily.

The operation must be performed above the fetlock at the place selected for high plantar neurotomy, external or internal. The artery being exposed I make a double ligature and then cut. I thus obtain considerable diminution of arterial pressure and of phalangeal ostitis intensity. On the two first horses I made ligatures with catgut and did not obtain cicatrisation by first intention; I obtained it on the third with silk ligatures. This new operation seems to me reasonable and simple. It has often been performed accidentally by clumsy operators. Less grave in its consequences than neurotomy, it "decongests" the tissues which neurotomy congests.

(M. G. Joly in the *Recueil Vétérinaire.*)

TETANUS IN THE DOG.

MESSRS. DUCOURNEAU AND JAYLES, veterinary surgeons in Paris, report a case of tetanus in a fox terrier which they cured. The treatment consisted at first of evacuation by sounding and washing out of the urine and of the fæces, the patient having been already for some time unable to answer satisfactorily to this double physiological need. Afterwards the animal was placed in a dark kennel and deprived of all exterior exciting influences. The same day it received 200 cubic centimetres of artificial serum, and in the evening 5 cubic centimetres of antitetanus serum. The next day the conditions were the same, the tetanus being generalised, and morning and evening 200 cubic centimetres of salted water and 5 cubic centimetres of antitetanus serum were injected. Catheterism of the urethra was performed twice in the day, and in the afternoon the rectum was washed out by means of a double-current sound. The following day the same injections and the same condition. The day after there was a slight expansion, the patient being able to take the yellow of an egg diluted in milk. The same treatment was continued, and the improvement gradually went on. Finally, a few days later, the animal was restored to its owner cured.

Some cases of generalised tetanus having been lately treated with injections of antitetanus serum as well as the classical treatment, it appeared to Messrs. Ducourneau and Jayles that it would be of interest to add the dog to the list of cures obtained by this method. Are we to conclude that the action of this serum has been all-powerful? These gentlemen do not think so; they know that from the curative point of view the action of this serum is considered as null, and that tetanus may very well be treated by "playing the waiting game." Nevertheless the action of this agent was so powerful, from the prophylactic point of view, that they are tempted to take the advice of certain confrères who believe that the effect of the rôle of the antitetanus serum on the organism attacked is not neutral. It would, to a certain extent, help the natural defence of the patient, and would thus help the action of other means.

(*Annales de Médecine Vétérinaire.*)

ON STENOSIS OF THE TRACHEA IN A TRACHEOTOMISED HORSE.

STRICTURE of the trachea is certainly the most frequent accident in tracheotomy, and its results are serious. In fact, three or four months after the operation, the introduction of the tube becomes increasingly difficult, and the roaring shows itself with as much intensity as before the operation, if not with more. Stenosis of the trachea is brought about by the thickening and induration of the edges of the wound operated on, their exaggerated budding, and their calcification; it is generally attributed to the use of too large tubes, which wound the tissues and require large clearances for their application. It is known that tracheotomy may be performed in different ways, notably by the partial excision of the two hoops, by the excision of the median portion of one hoop, and by vertical section of several hoops. Now, Messrs. Cadiot and Almy declare that these last two methods are but little used. The first, they say, is preferred, and justly, because it gives so little

chance of tracheal stenosis and of tracheocele. According to M. Peuch, it is just the other way. He says that tracheotomy by partial excision of two hoops exposes the animal more to stenosis of the trachea than does vertical incision of three hoops. The choice of tube is evidently important; he prefers the one he has himself invented, which is easily introduced, by reason of its small size and of the elasticity of the trachea.

(*Journal de Méd. Vét. de Lyon.*)

ON THE IMMUNITY OF PIGEONS AND GUINEA-PIGS VACCINATED AGAINST ANTHRAX, AND ON THE PROPERTIES OF THEIR SERUM.

M. J. DE NITTIS has freely vaccinated pigeons and guinea-pigs against bacteridian anthrax with Pasteur's vaccine, and has there studied the specific properties of the serum received from these animals. He has arrived at the following conclusions:—

1. A pigeon may easily and a guinea-pig with difficulty be vaccinated against anthrax by using anthrax vaccines.
2. Bacteridians introduced under the skin of vaccinated pigeons preserve their virulence.
3. The virulence of the bacteridian cultivated in immunising serum of the pigeon diminishes.
4. The serum from a vaccinated pigeon protects guinea-pigs and mice quite well against anthrax.
5. Bacteridians introduced under the skin of vaccinated guinea-pigs become attenuated.
6. Cultivated in the serum of vaccinated guinea-pigs, they seem to preserve their virulence.
7. The serum of a guinea-pig strongly vaccinated has no action on the infection of mice and guinea-pigs inoculated with anthrax.

(*Ann. de l'Instit. Pasteur.*)

TWO CASES OF SHOCK IN THE DOG.

PROFESSOR CADEAC says it is curious to observe the absence of bone lesions in the dog even after the more violent shocks, as, for example, those which result from a fall of several yards or from the passage over the animal's body of a heavily loaded vehicle. The lesions which are produced are the expression of a shock transmitted by the media of the organism such as the blood or the cerebro-spinal fluid. The animal succumbs without presenting for clinical examination any appreciable lesion. The two following cases are interesting:—(1) A setter was run over by an omnibus, two wheels of which passed over its body near the flank: when picked up the animal showed no appreciable injury, but it was quite stupefied and died twelve hours after the accident. The post-mortem showed only one lesion—a rupture of the vena cava; all the other organs were quite healthy and the osseus system showed not the slightest injury. (2) A pointer bitch running at great speed landed on a parapet wall of a height of 20 feet, and being terrified jumped right over. When her owner found her she was motionless

XUM

save for a slight trembling of the fore-legs, but she was not paralysed and showed no fracture. The pallor of the mucosæ, however, and the rapid increase of feebleness gave evidence of a vascular rupture. She died within some five hours of the accident. The post-mortem showed rupture of the right auricle and of the posterior vena cava with internal bleeding.

(*Journal de Méd. Vét. de Lyon.*)

EPIZOOTIC LYMPHANGITIS.

M. BERGEON reports the case of a horse which suffered in this way. He had applied the firing-iron to his hock for spavin, and the animal seemed to have almost recovered from the consequences of the operation when unforeseen complications arose. When M. B. returned he found one of the legs as big as an elephant's and constantly disturbed with shooting pains; the cicatrices of the firing operations were covered over and allowed the escape of white pus, streaked sometimes with blood-stained serosity. Quite distinct lymphatic lines furrowed the limb, and the overcharged inguinal ganglia were threatened with abscesses. The nasal mucosæ were unaffected, and the other three legs of the horse showed nothing abnormal. Tears kept forming in the eye, the conjunctiva was swollen, the general appearance was one of dejection. After a day or two of appropriate treatment the general condition of the animal improved, but the swollen condition of the leg persisted. M. B. then diagnosed infectious lymphangitis and treated the animal as follows. It was placed in such a position that the suffering limb was entirely inside a cask capable of containing 150 litres; this was filled with a $\frac{1}{1000}$ solution of bichloride of mercury, which was renewed from time to time. In this antiseptic bath the leg was kept immersed up to the buttock. Internally M. B. administered

Arsenious acid, . .	1 gramme.
Sub-carbonate of iron, .	10 grammes.

One dose of this was given daily. In a few days the general condition of the animal had distinctly improved, the swelling had abated, and the abscesses were disappearing. The treatment was continued till the animal was able to resume work.

(*Journal de Méd. Vét. de Lyon.*)

ON THE VIRUS OF TÆNIÆ.

RESEARCHES formerly made by M. Messineo on certain tæniæ in man, and more recent investigations by M. Mingazzini on intestinal worms, have resulted in the experimental confirmation of the old opinion that the noxious action produced by tæniæ is due to a toxic substance elaborated by them rather than to the mechanical irritation and the anatomical lesions brought about by these parasites on the intestinal mucosa of the "host." These two gentlemen proceeded as follows:—Fresh tæniæ were carefully washed in distilled water, first cold, then heated to 30-40°. They were then crushed in a mortar, openly at first, then after being placed in sterilised linen, until they were reduced to a pulp. This pulp was mixed with water

in a receiver which was placed in the stove (at 40-50°) for fifteen to sixteen hours; the extract was then filtered. But M. Messineo, with the approval of M. Calamida, has somewhat modified this plan in not washing the tæniæ in hot water, because at 40° a part of the virus might be weakened; he washes only with distilled water, and afterwards with the physiological solution of sodium chloride. Besides this he has given up placing the extract in the stove, in order to avoid the multiplication of micro-organisms which might accidentally be present there (a fact ascertained by cultural experiments), and in order, further, to avoid the possibility of partial injury of the albuminised substances. The extract was filtered through a Berkafeld filter.

The injection of these extracts of tæniæ subcutaneously and into the brain and peritoneal cavity of a great number of guinea-pigs, dogs, and rabbits produced in all these animals almost the same manifestations—shiverings, extending by degrees to all the body, staring coat, general dejection, paresis of the hind quarters, distinct fall in temperature. The majority of the animals inoculated subcutaneously were found next day to be in their normal condition, whilst those inoculated in the brain and peritoneum generally succumbed. At the post-mortems there was noted in the liver a very distinct dilatation of the capillaries, with a great many hæmorrhagic foci in the zone of the capillaries, especially in the periphery of the lobules. The hepatic cells were to a large extent affected with the beginning of granular fatty degeneration; there was slight leucocytary infiltration in the perivascular connective tissue. The kidneys also showed a beginning of the degeneration of the epithelial cells, dilatation of the capillary vessels, and hæmorrhagic foci in the interior of the glomeruli. In the brain the dilatation of the capillaries was still more marked than in the kidneys and liver. It is believed by the investigators that they have proved that the pathogenic action of tæniæ is due to a special poison rather than to a mere local mechanical injury.

(*Journal de Med. Vet. de Lyon.*)

TWO KIDNEYS WELDED TOGETHER IN THE SHAPE OF A HORSE SHOE.

THIS congenital anomaly was noticed by Dr. Voirin of Frankfort at the slaughter of an adult pig. The kidneys were united at their postero-inferior part by a commissure 3 centimetres broad and 1½ centimetres thick. This median piece was entirely formed of normal renal tissue. Otherwise the kidneys were perfectly normal.

(*Deutsche Thierärzt. Wochenschr.*)

MAMMARY TUBERCULOSIS.

M. G. VAN HARREVELT having had occasion to examine a great number of tuberculous cows, considers himself entitled to lay down the following principles as affecting dairy hygiene:—(1.) We may find tubercles in the supra-mammary ganglia without being able to ascertain the presence of tuberculous lesions by palpation of the udder, nor even by incision of that

organ. (2.) When there is mammary tuberculosis the ganglia of the udder are not always hypertrophied or indurated, as is often observed in the other ganglia. (3.) It is frequently found that there is tuberculosis of the udder and of the mammary ganglia even although the tuberculous processes be absolutely localised in another part of the body. M. van H. thinks that in a great number of cases mammary tuberculosis is impossible to diagnose whilst the animal is alive: this diagnosis is often difficult at the post-mortem. In such cases bacilli may be found in the milk although nothing wrong was found in the udder. It follows that if we wish to procure milk certainly free from bacilli the proper course is to tuberculinise every milch cow, and refuse the milk of any animal which has shown positive reaction. Would it not be possible to pasteurise all milk intended for human food? It is at any rate important to examine minutely the mammary glands of all animals recognised as tuberculous.

(*Tijdschrift voor Veeartsenükunde.*)

THE RELATIONS OF HUMAN TO BOVINE TUBERCULOSIS.

OSTERTAG deals with the question as to the identity of human and bovine tuberculosis (*Zeitsch. f. diaet. u. physik. Therap.*, No. 6, vol. 5.) Glancing through the history of the pathology of bovine tuberculosis (*Perlsucht*) he finds that without any motives having been given, the consumption of meat of tuberculous cattle was already forbidden by law in the ninth century. The first reason accorded for the prohibition was that in the eighteenth century it was believed that the disease and human syphilis were identical. Gerlach was the first who showed that it was a form of tuberculosis, but this point was not actually settled until Koch discovered the tubercle bacillus in both conditions in 1882. Virchow had adopted the opinion that bovine tuberculosis was a sarcomatous growth. Last year Koch disputed the identity which he had been convinced of. Passing by the experiments of Koch and Schultz, which show that the bacilli of human tuberculosis were incapable of producing *Perlsucht*, he attacks the question by considering the wisdom of forming any conclusions in the reverse direction. As to the facts, he finds that the same experiments had been performed before by Puetz, who concluded that a carrying over of human tuberculosis to cattle under ordinary circumstances is either extremely rare or does not occur at all, and that the possibility of infection of man from bovine tuberculosis was by no means proved. Theobald Smith, Frothingham, and Dinwiddie also adopted similar views. Allowing a large amount of doubt whether there is any danger of carrying over human tuberculosis to cattle, he says that he regrets that Koch should have gone so far as to express himself that it is not necessary to avoid the ingestion of the bovine bacillus. That this has already produced much difficulty he shows by quoting some resolutions passed by various Agricultural Boards in reference to the inspection of meat. Koch based his opinions that tuberculous meat and milk do not produce tuberculosis in the human subject on the ground that primary intestinal tuberculosis is very rare, but it is by no means proved that just these rare cases are not produced by this means. It has been shown that under certain conditions tubercle bacilli act much more virulently than under other circumstances; for example, the diseases pro-

duced by an injection of tubercle bacilli with pyogenic cocci is more acute than that produced by tubercle bacilli alone; and that such an attenuation as is known to take place in the case of small-pox, when carried over to the calf, is not improbable in the case of tuberculosis. On the other hand, as M'Fadyean has shown, primary intestinal tuberculosis is believed by some reliable observers to be common, rather than rare. However this may be, Ostertag has found that in feeding experiments with swine, he has never seen primary intestinal tuberculosis, but always nvasion of the gland of the larnyx, throat, and mesentery. These animals nearly constantly develop beside the mesenteric, tuberculosis of the lungs and bronchial glands. He believes that further investigation will prove that the relation between the bacilli of human and bovine tuberculosis are akin to those between avian and mammalian tuberculosis. Supporting this view he quotes the few positive "carrying over" experiments of Kitt, Bollinger, and others, and the point which Baumgarten brings forward, that from the scrofulous glands of human subjects fatal tuberculosis can be produced in the rabbit. He further considers it as proved that bovine tuberculosis can be carried over to man. In support of this, he calls attention to the cases reported by Moses, Priester, and Ravenel. Objections have been raised to these cases, but they are not conclusive. Besides these cases, there are a number of severe infections which have been traced to cattle or milk. Ostertag says that the proper place to decide these and similar questions is the Commission, but that until it has been clearly proved that the two conditions are separate diseases, one has no right to relax the rules for preventing infection by milk and meat of tuberculous cattle. Still it must be recognised that Koch has done a good service by stimulating scientists to carry out so much important work. It is to be hoped that this work of investigating the question will have the desired effect of finally settling it.

(*British Medical Journal*, Aug. 16, 1902.)

SURGICAL INTERFERENCE IN DISEASES OF THE LUNGS IN MAN.

R. Riegner (*Deut. med. Woch.*, July 17th, 1902) deals with the indications for surgical interference in diseases of the lung, basing his remark on the experience gained in Fraenkel's clinic in Berlin. The operative treatment of empyema is not included, as the surgeon always undertakes this treatment, nor does he deal with those conditions which are associated with empyema. He discusses the following questions in connection with various pulmonary conditions: (1.) Is the operation necessary, and on which grounds? (2.) Which conditions must be present to justify the operation, and how can we determine these conditions? Abscess of the lung may, but need not, lead to gangrene. Acute abscess after pneumonia mostly does not need operation, as the prognosis is usually good. Following influenza, it is frequently liable to lead to gangrene, and therefore the interference is more often necessary. If the pus finds its way into the pleura one must lose no time in letting it out, but if it escapes through a bronchus, no operative treatment is required. Acute abscesses, which take a long time to burst through a bronchus or elsewhere, should be taken as an indication for operation. In the case of

chronic abscess the conditions are more or less similar, and one must keep in mind that the natural tendency of healing is but small. Whenever there is a danger of the pus bursting through the pleura, and when the patient's strength is affected, one should perform pneumotomy, with free re-section of ribs. Hæmoptysis is also to be regarded as an indication of the operation, for a fatal termination from hæmorrhage may take place at any time. Turning to the subject of gangrene, he says that if the process is circumscribed, and not multiple, and when the focus is comparatively near to the surface, one ought to operate. The diagnosis is very difficult in some of the cases, and frequently physical examination will not enable one to come to a correct conclusion. The expectoration will help in many cases, and when one finds macroscopic shreds of lung parenchyma, together with Dittrich's "plugs," and when the sputum has an objectionable smell, one should examine carefully to see if a solitary patch of dullness is to be found anywhere; the more easily the physical signs are elicited the nearer the focus is to the surface. One can learn more of the condition by means of skiagraphy, which will often disclose the exact situation of the gangrene. The chances of success by operation are immeasurably better in acute gangrene than in chronic gangrene. Surgical interference for bronchiectasis and tuberculosis is little likely to be of much service on account of the rarity of solitary foci, but in sack-like bronchiectasis, which gives rise to a large quantity of putrid secretion, one may have the luck to be dealing with a single focus, and therefore one should consider the question of operation.

TUBERCULIN IN HUMAN ABDOMINAL TUBERCULOSIS.

Denys (*Presse Méd. Belge*, July 6th, 1902) recounts his experience with the filtered, unheated, bouillon of the tubercle bacillus in twelve cases of abdominal tuberculosis. In two the treatment was not complete at the time of writing; of the other ten the full histories are given. One of these died of an intercurrent attack of lobar pneumonia, not associated, according to the author, with the tuberculosis; he believed that but for this, as it were, accidental complication, the patient would have recovered. Of the nine remaining cases eight are stated to have been completely cured, while the ninth would have been so but for a severe anæmia resulting from climateric menorrhagia. Of these nine patients seven had tuberculous peritonitis with ascites, and of them six had fever as well. This symptom entirely disappeared in a time varying from a few days to five months, according to its severity. In two cases another factor was introduced, laparotomy in one, tapping in the other, but the author considers the cures to be due to the tuberculin and not to these other measures. Some of the patients seem to have been suffering from tuberculous peritonitis for as long as ten or eleven years. Denys regards the curative action of this bouillon as incontestable, and that fever is no contra-indication to its use.

THE EARLY PATHOLOGICAL CHANGES IN THE NERVOUS SYSTEM PRODUCED BY RABIES.

Anglade and Choireaux (*Prog. Méd.*, May 31st, 1902) state, in a communication made to the Société de Biologie, the results of experiments

made to determine the earliest lesions found microscopically in the nervous system as to the result of rabies. They conclude (*contra* van Gehuchten) (*a*) that the lesions found in the nerve cells are not specific and diagnostic as regards rabies, and are not early enough in appearance as compared with lesions of the neuroglia and blood-vessels; (*b*) changes in the glia and blood-vessels appear early and in an intense decree, and afford a valuable diagnostic feature; (*c*) the changes in the neuroglia and in the capillaries are contemporaneous, the endothelium proliferates and the perivascular network of neuroglia becomes infiltrated with "nuclei" intermingled with blood corpuscles which have emigrated from the blood vessels, the corpuscles being less abundant than the neuroglia nuclei above mentioned; (*d*) these nuclei, which pervade the parenchyma of the nerve tissue surround the cell bodies of the nerve cells, and by their presence and the pressure they produce the nerve cells are irritated; (*e*) the neuroglia cells of the ependyma also proliferate, giving rise to both fibrils and nuclei, which push the epithelium into elevations which project into the ventricular spaces. The neuroglia fibres and cells also apear to stretch among the groups of nerve cells near the ependyma (as in the floor of the fourth ventricle; (*f*) many of these changes, say the authors, may be observed in epilepsy, general paralysis, and in some forms of tuberculosis of the nervous system. The virus of rabies, however, produces these changes in a few days, whereas the other diseases take years to bring about similar changes.

(*British Medical Journal*, August 16, 1902.)

THE PROPHYLAXIS OF MALADIES DUE TO THE TRYPANOSOMA.

Laveran and Nocard (*Bull. de l'Acad. de Méd.*) state that recent facts have shown that the effects of the trypanosoma are tending to spread beyond their present limits through commercial intercourse, &c. Grave epidemics have lately occurred in Java, the Philippines, and the Mauritius. The authors direct attention to this, as many of the French colonies are in continual relation with the latter island, and surra (the malady caused by the trypanosoma) was until lately unknown here. About four months ago this epizoötic disease broke out amongst the horses and cattle, and caused a large number of victims. The affection showed itself by remittent fever, with a rapid and profound anaemia, whilst blood examination showed the trypanosoma identical with the organism of surra. The disease was imported from India; ordinarily Mauritius is provisioned from Madagascar as regards cattle, but owing to the Transvaal war most of the animals were bought up for South Africa, and hence they had to be got from India; infected beasts were introduced, and the disease thus propagated in the island. In the beginning of June M. Deixonne telegraphed that the mortality from surra was frightful, and quite irresponsive to treatment. MM. Lesur and Deixonne found the trypanosoma in great numbers in the blood of the diseased animals. M. Carié forwarded specimens to the authors. It might be objected that the disease was not surra, as Indian cattle resist this affection, but this resistance is acquired through long exposure to the epizoötic, which always attacks virgin soil more severely. The authors insist that the disease in the Mauritius is surra, and point out the danger threatening Madagascar and Réunion. Vassal in the latter island has already reported a case.

The affection is spread through the agency of flies; not every fly, however, acts thus, as on the East Coast of Africa an allied disease has been imported from the interior, but has not spread, owing to the absence of the special fly. A parallel can be seen in the case of malaria. Before 1867 it was unknown in Mauritius; in this year a sudden outbreak occurred owing to the prevalence of the *Anopheles*. The tsetse fly in surra plays the part of the *Anopheles* in malaria. The disease is nearly always fatal, and resists all remedies; arsenic may delay the fatal event, but cannot prevent it. As practically all mammals except man are attacked, we can see how calamitous the disease proves to an agricultural country. The question confronts us. What means of protection have we? All that can be done is to guard against its importation by prohibiting the bringing in of cattle from infected regions. Animals arriving at the port must be examined by experts, and killed if found to be infected. Microscopical examination, if giving negative results, is not decisive, as the organism may exist in but scanty numbers: hence experiments on rats and mice by inoculation are indicated, whilst the suspected animals are isolated and protected from flies till the result of the experiment is known. If these measures be put in hand at once importation from the port to the interior could be prevented. The authors proposed and carried the motion at the Academy of Medicine: "That the importation into France or the French Colonies of animals coming from a country where diseases due to the trypanosoma are rife be either prohibited or placed under the most severe regulations.

(*British Medical Journal*, August 16, 1902.)

THE PATHOLOGY OF THE CEREBRAL NEUROGLIA IN EPILEPSY.

ANGLADE, in the recent communication to the Société de Neurologies (*Archiv. de Neurolog.*, May, 1902) gives the result obtained by the most recent processes of staining and studying the neuroglia in numerous cases of idiopathic epilepsy, and of Jacksonian convulsions due to cerebral tumours. He finds the nerve cells, and in particular the pyramidal cells of the cortex, intact, even in patients who have died of status epilepticus. The neuroglia elements, on the contrary, never appeared normal, either as individual cells or in their relative proportion as a brain constituent. The neuroglia cells showed increase and proliferation in the form of plaques or patches of hard consistence (sclerosis). These were met with in various parts of the brain substance, and were conspicuous as a cause of hardness in the hippocampal region, the pons, and the bulb. They even affected the spinal cord. In a communication by John Sutcliffe and Sheridan Delépine (*Journ. of Mental Science*, April, 1902) of a patient suffering from idiopathic epilepsy since the age of twenty-two years, and who died at the age of thirty-eight from epileptic mania, the brain (cerebrum, cerebellum, and pons) was of excessive weight, namely 69 ozs. All parts of the encephalon were enlarged owing to the overgrowth of neuroglia (diffuse hypergliosis), in some regions the growth producing soft gliomatous tumours containing little or no nervous tissue. Microscopical examination showed general increase of the neuroglia, but among the pyramidal cells there were observed some which were clearly degenerated, while the giant cells of Betz appeared larger and more numerous than in the normal brain.

(*British Medical Journal*, August 16, 1902.)

XUM

DISINFECTION OF HANDS WITH ALCOHOL.

R. SCHAEFFER (*Berl. klin. Woch.*, Nos. 9 and 10, 1902) regards the conclusions drawn by Paul, Sarwey, Krönig, and others, that no means or method exist by which the hands may be rendered even moderately free from micro-organisms as too sweeping, and inquires carefully into the question from a practical point of view. One may attempt to disinfect hands by (1) mechanical means, and (2) chemical solutions. The first method is absolutely untrustworthy. In his investigations with chemicals he classifies the various solutions according to the number of colonies which appear on an agar plate which had been inoculated with the scraping of the skin by a sterile toothpick. In all cases he speaks of "poverty of germs," and not "absence of germs." In the case of disinfection with alcohol he washes his hands for five minutes vigorously in very hot water. with soft soap and a clean nail-brush. The nails are then carefully cleansed with a suitable instrument, and the hand energetically rubbed with a sterile towel. After this he scrubs his hands for three or five minutes in alcohol, changing it once or twice. His experiments give very much better results with this method than with disinfection by other means. Mikulicz's soap spirit gives the next best results, but these, when compared with the "alcohol method," may be numerically expressed (average number of colonies) as 3·25 in favour of Schaeffer's method. Lysol (1.75 per cent.), hydrarg. oethylene-diamin (4 per cent.), corrosive sublimate (1 per cent.), chinosol (6 per cent), lysoform (3.3 per cent.), and Scheich's marble soap gave very unsatisfactory results, the number of the colonies increasing in the order given, and being very considerable. The last-named gave about the same results as simple washing in hot water and soap. Inquiring into the method of action of alcohol, he finds that its bactericidal properties are not marked, as demonstrated by brushing the hands infected with staphylococcus in 150 grams of alcohol, after washing in hot water for one minute, and after the lapse of twelve minutes, testing the filtrate of the alcohol on agar plates. A second method of action depends on the hardening properties of alcohol, while a third rests on its power of dissolving fats and epithelium. Schaeffer states that the chief value of alcohol as a disinfectant for the hands takes place by means of mechanical cleansing, and not of a chemical change. He believes it to be the best method known up to the present time.

TUBERCULOSIS IN A PYTHON.

MR. S. G. SHATTOCK recorded the above specimen. The lesions of unusual character were those of the œsophagus, in the mucosa of which there were a series of oval swellings, each consisting of a compact aggregate of small spherical tubercules. No such lesion was met with in the human subject, in whom tuberculous disease of the œsophagus was known only as a result of direct extension from a neighbouring structure. The peculiar lesions in question were explained by the fact that in ophidia there occurred normally in the mucosa of the œsophagus oval lymphatic nodules or "glands" like those of the intestine; they lay immediately beneath the epithelium, which was of the columnar-celled variety. The author viewed the infection as direct, and due to the consumption of tuberculous food,

XUM

the main lesion being at the stomach. The food consisted of ducks, and the bacillus was probably avian in source. Acid-fast bacilli were demonstrable in the œsophageal lesions. The author drew attention to the absence of ulceration over the lesions, the infection having occurred between the cells of an intact epithelium. It was not so much that the bacillus had selected the sites as that the sites had selected the bacillus. The process was a transport of bacilli through an intact epithelium by wandering cells like that of inhaled inorganic particles to the bronchial glands. As regarded the temperature, it had long been known that the tubercle bacillus would grow at comparatively low temperatures, and as the python in question had lived in an atmosphere of 70° F., the temperature of the water in its tank being as high even as 80° F., the growth of the bacillus offered no difficulty, although occurring in a "cold-blooded" form.

Review.

TIBIO-PERONEAL NEURECTOMY FOR THE RELIEF OF SPAVIN LAMENESS. By W. E. A. WYMAN, V.S., M.D.V. Published by WILLIAM R. JENKINS, 851 & 853 Sixth Avenue, New York.

This is a small book of 30 pages in which the author sets forth his observations on tibio-peroneal neurectomy for the relief of spavin lameness —observations which have extended over two years, and been drawn from a large number of cases, viz., 91. For about fifty years re-section of the posterior tibial nerve has been recognised and employed as one of the methods of treating spavin lameness, but with only indifferent results. In 1898 Professor Bossi of the Veterinary School of Bologna published some researches on the part which the anterior tibial nerve played in the enervation of the hock, and these researches induced the author to try a combination of both neurectomies, the results of which are given in the book. The author says that the anatomical descriptions of the course and relationship of the peroneal nerve are often misleading, and he therefore gives directions how to locate it.

After giving the technique of the operation and the sequellæ, the author gives a tabular list of the 91 cases, and claims complete removal of the lameness in 55 cases, slight lameness in 18 cases, and results unknown in 7 cases. The author therefore makes out a strong case for the efficacy of this operation for the relief of spavin lameness, especially so if he has acted up to what he preaches on page 2. "As a rule all known surgical means should be exhausted before tibio-peroneal neurectomy is proposed." Any one wanting to perform this operation should procure this little treatise; he will find it of considerable help, as the peroneal nerve is not as easily found as, for example, the plantar.

CONTAGIOUS DISEASES ANIMALS ACTS, 1864 AND 1890.

SUMMARY OF RETURNS OF OUTBREAKS for the Four Weeks ending 16th August 1902.

ENGLAND AND WALES.

Swine Fever.	Anthrax.	Glanders (including Farcy).	Sheep-Scab (for month of July).
Outbreaks 137 Slaughtered 469	Outbreaks 38 Attacked 58	Outbreaks 81 Attacked 132	Outbreaks 7

SCOTLAND.

Outbreaks 10 Slaughtered 99	Outbreaks 4 Attacked 5	Outbreaks 2 Attacked 2	Outbreaks 1

IRELAND.

Outbreaks 21 Slaughtered 233	None.	None.	Outbreaks 17

Communications, Books, Journals, &c., Received.

Agricultural Journal (Cape of Good Hope); Berliner Thierärztliche Wochenschrift; La Clinica Veterinaria (Milan); Deutsche Thierärztliche Wochenschrift; Tannoform in Veterinary Medicine (March); The Sanitary Journal; Scottish Medical and Surgical Journal; Veterinary Record; La Riforma Veterinaria; Le Mois Scientifique (Paris); L'Echo Vétérinaire (Liège); Annales de Médecine Vétérinaire (Brussels); Johns Hopkins Hospital Reports; Journal of Comparative Medicine and Veterinary Archives; Recueil de Médecine Vétérinaire; Gazette Médicale de Paris; Modern Medicine; Johns Hopkins Hospital Bulletin; Il Veterinario di Campagna (Moncalieri); Le Bulletin Vétérinaire (Orleans); Revista de Medicina Veterinaria (Bucarist); La Revista Veterinaria (Buenos Aires); Zeitschrift für Fleisch-und Milchhygiene (Berlin); Buletinul Societatii de Sciinte diu Bucuresci-Romania; The Meat Trades Journal; The Dental Record.

BY ROYAL WARRANT

HORSE CLIPPER MAKERS

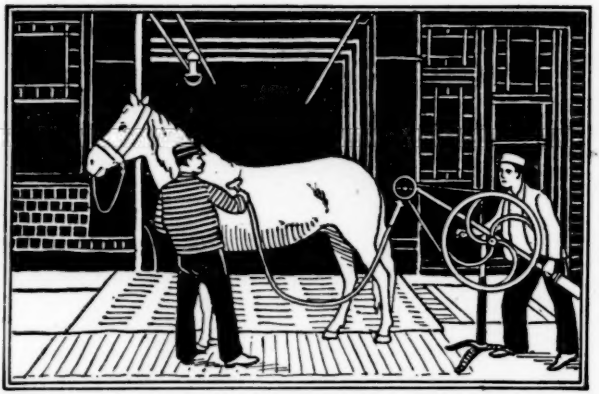
TO HIS MAJESTY THE KING.

OF APPOINTMENT.

The BARTON-GILLETTE
HORSE-CLIPPING MACHINE.

AWARDED TWO FIRST PRIZES, ROYAL SHOW, YORK, 1900
(in Open Competition), and TWELVE MEDALS.

Fitted with the only absolutely Flexible Shaft on the Market.



Ball bearing Knives which cannot heat, and Patent Grip Pulley which prevents the Belt from slipping.

PRICES from £3 (Liberal Discounts to the Profession).

THE ONLY HORSE-CLIPPING MACHINE EVER AWARDED PRIZES OR MEDALS IN ENGLAND, SOUTH AFRICA, AND HUNGARY.

BEWARE OF USELESS IMITATIONS.

Send for Illustrated Catalogue containing Testimonials from leading Veterinary Journals.

The BARTON-GILLETTE
HORSE CLIPPING AND SHEEP SHEARING COMPANY,
LIMITED,
103 NEW OXFORD STREET, LONDON, W.C.

Professor PRITCHARD.

Colonel DUCK, C.B.

Mr. WRAGG.

Mr. HUNTING.

Principal M'FADYEAN, Pres. N.V.A.

Professor M'QUEEN.

Mr. HURNDALL.

Principal WILLIAMS, Pres. R.C.V.S.

Colonel STEELE.

Mr. MASON.

Mr. SIMPSON.

Mr. J. J. BELL.

SOME REPRESENTATIVE MEMBERS OF THE NATIONAL VETERINARY ASSOCIATION "UP THE RIVER," 1902.